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Blooming Mill Has Heavy Drive

Largest Single-Unit Reversing Motor Now in Service at Wisconsin Steel Works—New Mill Replaces Steam-Operated Unit

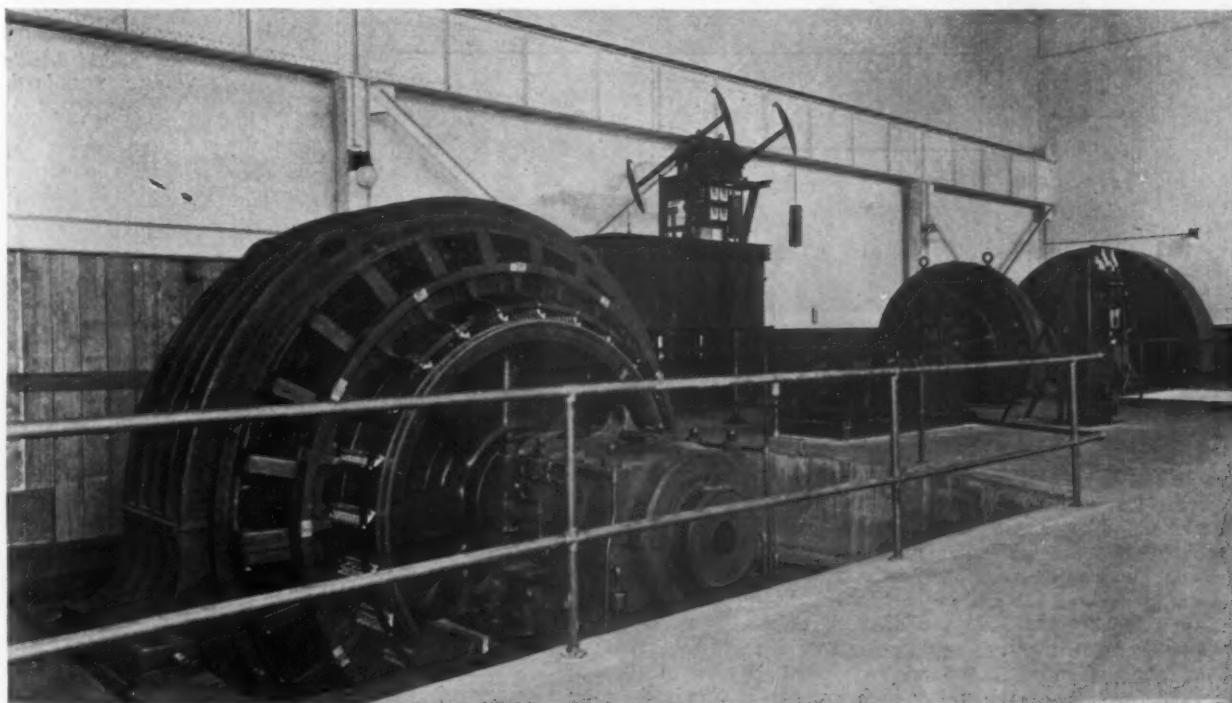
BY ROGERS A. FISKE

THE largest single-unit reversing motor built to date is the drive of a new 40-in. blooming mill at the Wisconsin Steel Works, South Chicago. This mill is electrified throughout and will supplant, when in full operation, a steam-driven blooming mill which has been in service for about 20 years. The capacity of the new mill is estimated at 40,000 tons per month when rolling down to 4 x 4-in. billets. It is probable, however, that in the future the company's Bessemer plant, which is located east of the new mill, will be moved to the south, thus making room for a second mill unit. If that plan is put into effect, the present electrically-driven blooming mill will roll to an 8 x 8-in. bloom, which will give it a capacity of about 70,000 tons per month. The proposed unit would roll from an 8 x 8-in. bloom to a 4 x 4-in. billet. This arrangement would necessitate placing a saw about half way down the run-out table.

Current for the mill motor is supplied through elec-

trical cables, installed in duplicate, which enter the basement of the motor room and are tied to a common bus system from which the mill motor switchboard is fed. This board is located in the motor room and is under remote control from the blooming-mill pulpit. Three-phase 60-cycle current reaches this board at a voltage of 2300 and is fed directly to a motor-generator set and exciters. The former consists of two d. c. generators, each rated at 3000 kw. and 700 volts, a 14-ft. 3-in. cast steel flywheel which weighs 100,000 lb. and a 4000-hp. induction motor, all mounted on a common shaft. The speed of this unit is 352 r.p.m. The rated temperature rise of the motor is 50 deg. C. and that of the generators 40 deg. C.

The motor driving the mill is rated at 7000 hp., 700 volts, 50 to 120 r.p.m., with a temperature rise of 50 deg. C. over the speed range of 0 to 120 r.p.m. The exciter set is a three-piece unit consisting of a 130-hp. constant speed induction motor, direct connected



The Drive of the Mill Is the Largest Single-Unit Reversing Motor in Service. It is rated at 7000 hp., and current is supplied at 700 volts by two direct-current generators, driven by a single induction motor. Auxiliary equipment consists of a three-piece exciter unit and a slip regulator

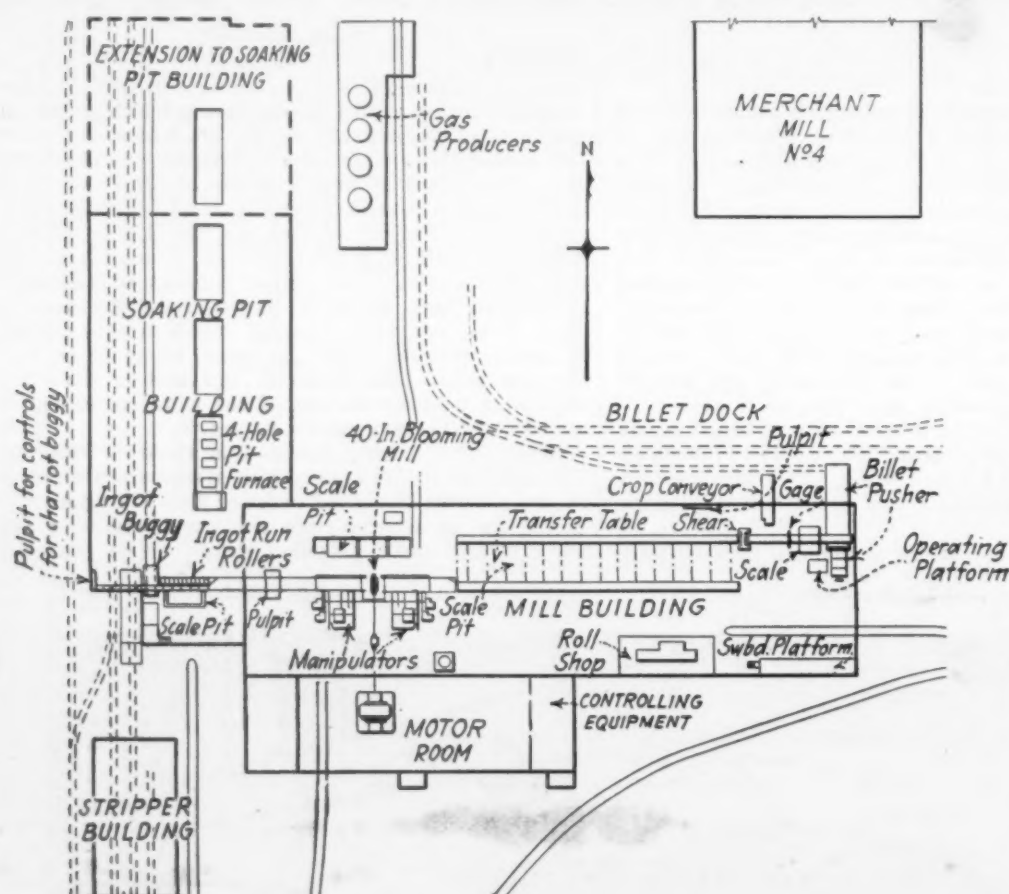
to a 70-kw. constant-potential 250-volt d. c. generator and a 15-kw. variable-potential 240-volt d. c. generator. This unit operates at a speed of 685 r.p.m. A slip regulator has also been provided.

The two generators of the motor-generator set are connected in parallel and they feed to the mill motor. It is interesting to note that the peak loads, which are heavy but of short duration, are ironed out only in part by the mass of the motor armature, the bulk of this work falling to the flywheel of the motor-generator set. The sudden demand for power created by a peak load tends to slow down the induction motor; this allows the fly wheel to give up some of its kinetic energy to meet the momentarily increased demand for power. The shunt and series windings of the motor are not interconnected. The main motor shunt field and the generator fields are supplied with current from the constant-potential exciter, whereas the series field of the main motor is furnished with current by the variable-potential exciter. Thus it is seen that the main motor has the characteristic of a compound

East Pittsburgh. A 75-ton single-hook motor-operated crane which serves the motor room was furnished by the Morgan Engineering Co., Alliance, Ohio.

The motors in auxiliary service throughout the mill are under remote control, their switchgear being placed in a separate room to the east of the main motor room. All auxiliary drives are made by means of d. c. motors. The Cutler-Hammer Mfg. Co., Milwaukee, Wis., furnished all auxiliary control and master switches, limit switches on the transfer table, switches on the manipulator lift and also the limit switches on the shear clutch, the shear table pull back and the shear table lift.

A stripper building is located south of and in line with a soaking pit building and the blooming mill adjoins at right angles to the soaking pit building. Ingots are transported over narrow-gage track to the soaking pit building and are then handled to or from the pits by means of either of two charging cranes, furnished by the Alliance Machine Co., Alliance, Ohio. The runway for these cranes extends over the floor in



The Center Line of the Blooming Mill Is at Right Angles to the Soaking Pit Building. It is probable that in the future the mill will be extended to the east. Controls for the mill are located at three points: in the main pulpit at the rolls; in a pulpit just west of the shear, and at the operating platform near the billet pusher. The dotted double lines indicate narrow-gage track; the solid double lines, standard-gage track

wound machine, that is, constant speed from no load to full load. To reverse the main motor it is necessary only to reverse the field current of the exciter set, thus reversing the generator fields, which in turn changes the direction of rotation of the main motor.

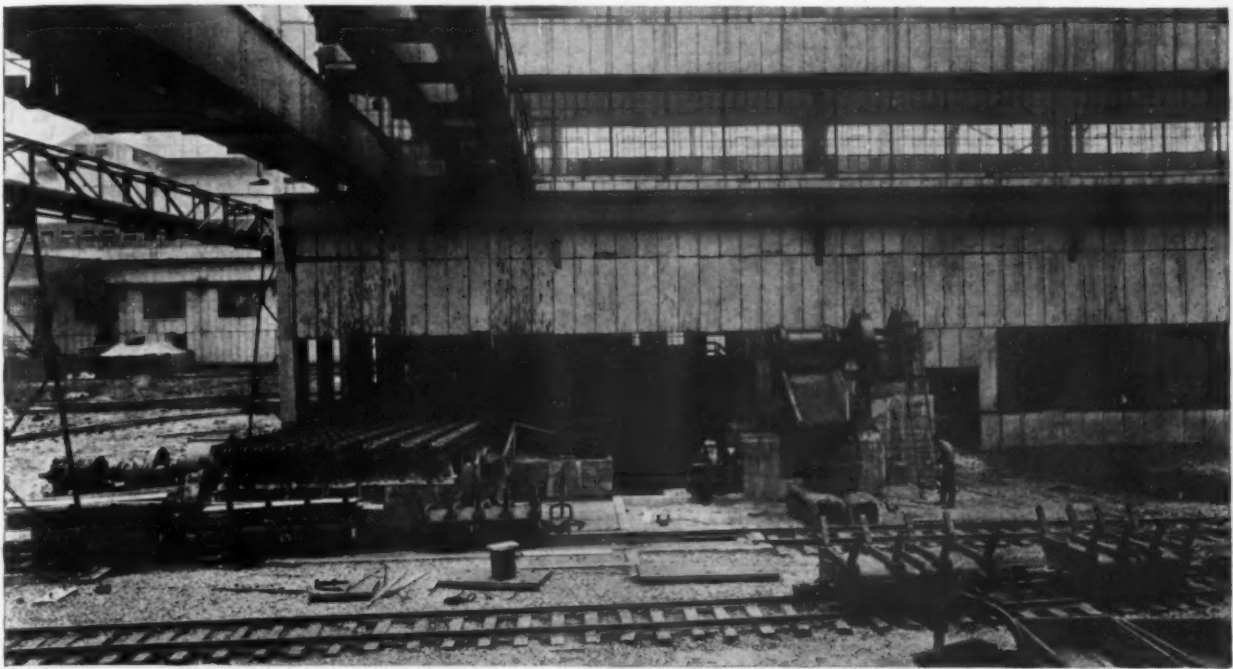
In the basement of the motor room are two motor-driven air washer and fan units furnished by the American Blower Co., Detroit, Mich. One of these provides 50,000 cu. ft. of air per min. to the main motor. The other unit ordinarily provides air for the motor-generator set and to certain of the motors near the rolls. The air ducts are so arranged, however, that either fan unit can supply air to the main motor. This precaution is taken to safeguard against the possible failure of the unit which ordinarily furnishes cooling air to the main motor.

All the electrical apparatus in the motor room, including the main motor, the motor-generator set, the exciter set, the slip regulator and the switchboard, was furnished by the Westinghouse Electric & Mfg. Co.,

the northwest corner of the blooming mill. This arrangement has been used to great advantage in the operation of the old blooming mill, for by it billets could be removed from the soaking pits and deposited in cars standing on a narrow-gage track in the new blooming mill. From that point it is only a short haul by locomotive to the old mill. In this manner the old mill has been kept in full operation during the construction of the new blooming mill.

Ingots Not Carried Over Roofs of Soaking Pits

It will be well to mention here the advantages derived from the respective locations of the soaking pit and blooming mill buildings. The delivery track in the soaking pit building runs north and south, that is, parallel to the charging-crane runway. There are four 4-hole pit furnaces so arranged with their regenerators that the cranes have no occasion to carry ingots over any other pit than the one it is charging or drawing. The regenerators to the east are not

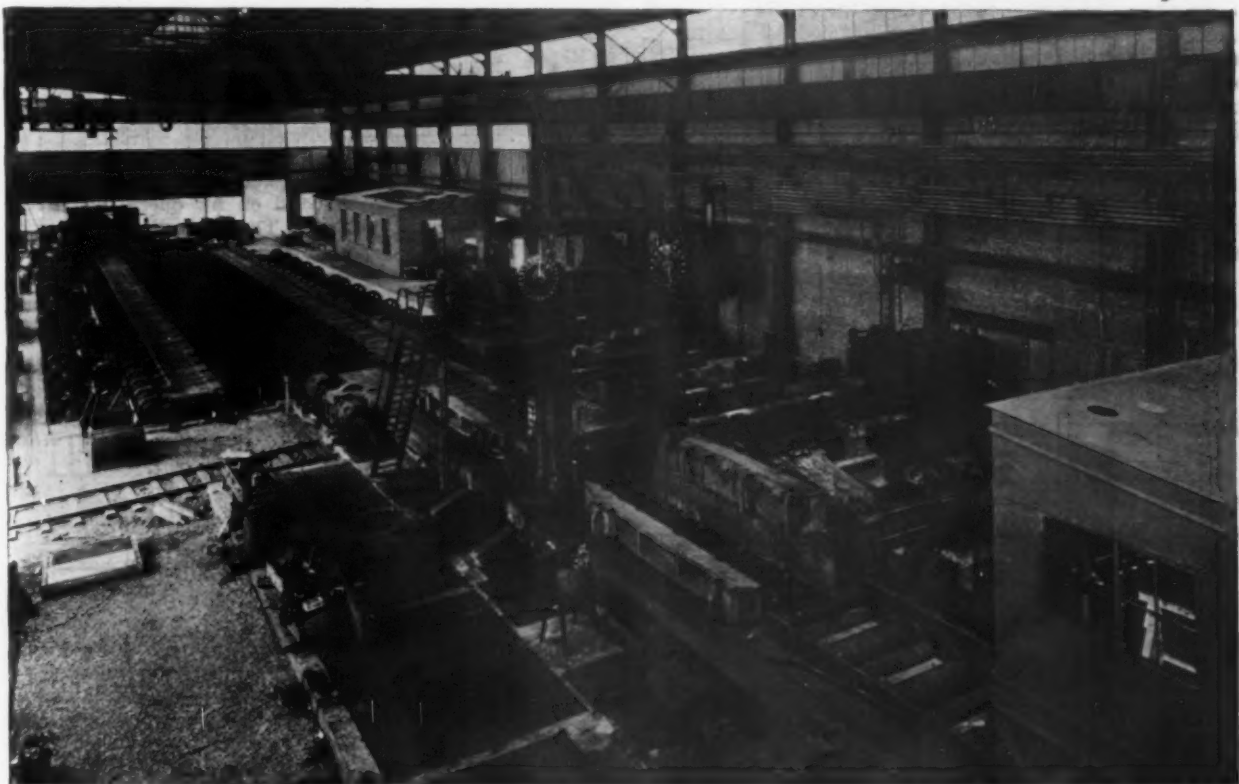


At the Left Is a Conveyor Which Discharges Billets into Narrow-Gage Cars on Which They Are Taken Either to the Merchant Mills or to the Billet Storage Dock. The conveyor at the right handles crop ends from the shear pit to scrap buckets which are moved by overhead crane

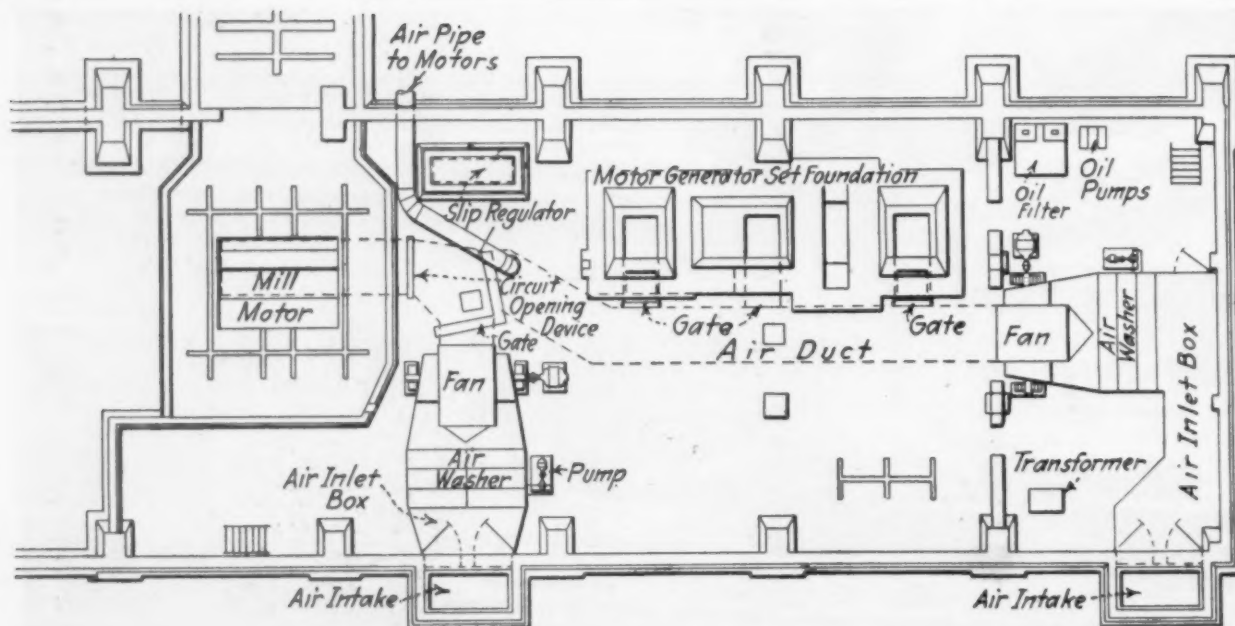
under the crane runway. They are covered by a steel platform which is raised high enough to allow free movement of the pit covers and their mechanism. The regenerators to the west are protected by a rail steel and concrete floor. Thus it is seen that a loaded crane need pass over only that pit which it is working and the corresponding regenerator, which is protected against damage from a falling ingot by a special floor. The charging crane deposits the ingot in

the ingot chariot car which travels the full length of the soaking pit building and at right angles to the center line of the blooming mill. This car is operated from a pulpit on the west side of the soaking pit building and opposite the ingot run-in table, which is separated from the approach table by an automatic switch gate.

Ingots leaving the approach table pass to the front feed table, then through the 40-in. two-high reversing



The Electrically-Operated Manipulators, One of Which Is in the Foreground, Are So Constructed that All Parts Which Might Need Replacement Are Readily Accessible to the Overhead Electric Crane. The mill and transfer table are shown in the center and background



In the Basement of the Motor Room Are Two Air Washers Which Supply Washed and Cooled Air to the Main Motor and the Generator Equipment. The arrangement of the air system is shown in the basement floor plan

mill, which is provided with an electrically-operated manipulator on each side of the rolls, that is to say, opposite the front and back feed tables. It is to be noted that these manipulators are so constructed that every part is readily accessible to the overhead electric crane, that is, all parts which might need replacement can be reached without dismantling the feed tables or working underneath them. This construction eliminates the necessity for a basement beneath the feed tables.

A 500-lb. accumulator has been installed to provide hydraulic power for balancing the upper roll, for the jack on the lower spindle and for the shear gag. Loss of water occurs only when the spindle jack is used. Hydraulic pressure is maintained by means of a Worthington Pump & Machinery Corporation 2 $\frac{3}{4}$ x 6-in. triple-plunger pump geared to a Reliance Electric & Engineering Co. d. c. motor, which is rated at 20 hp., 230 volts and 900 r.p.m.

Easy Removal of Rolls

Rolls are removed and replaced through the housing by first fitting a coupling to the neck of the old roll and then fitting the new roll into the opposite end of the coupling. In this way the load is balanced and can

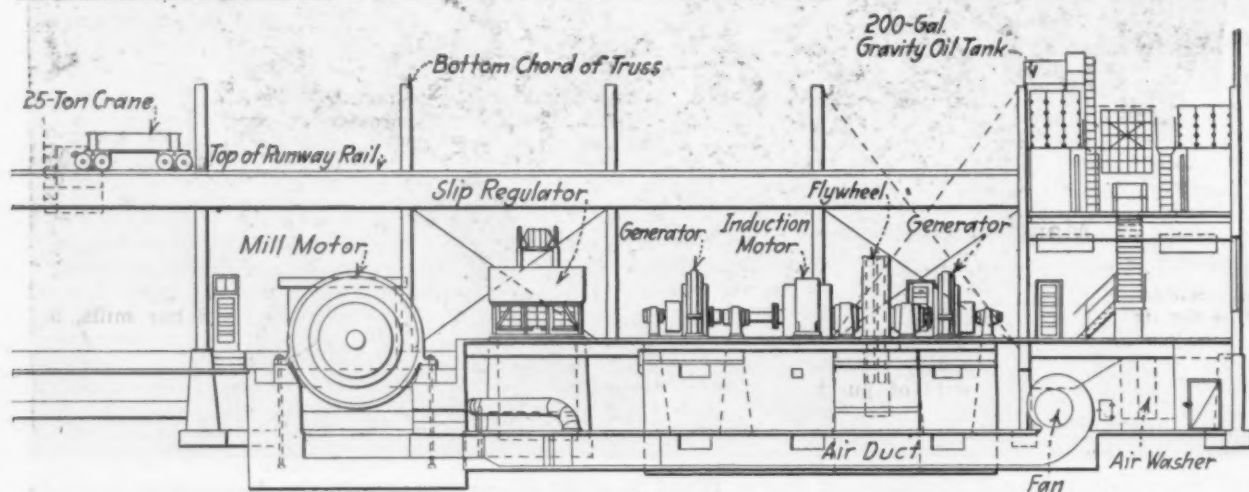
be handled easily by the crane. When the old roll has been swung clear of the housing, the load is turned end for end and the new roll is slipped into place, after which the old roll and coupling are removed.

The finished billet passes from the back feed table to the transfer run-out table which is 150 ft. in length. Transfer cables are on 10-ft. centers, and the distance between the center lines of the rollers on opposite sides of the transfer table is 25 ft. 1 in. The rollers are spaced on 5-ft. centers and their length on both the run-out and the run-in tables is 4 ft.

Control of the billet from the time it reaches the run-in table to its delivery to the shears is provided for in a pulpit located on the north side of the table and to the west of the shears.

Upon delivery to the shears the billet is cropped, the butt falling to a pit where it is picked up by a drag-type conveyor which discharges over a narrow-gage track located just outside of the blooming mill building.

Controls for the shear gage, the billet pusher and the billet conveyor are located on an operating platform near the billet pusher. The scale for weighing billets is located between the shear gage and the billet pusher. The billet conveyor discharges to narrow-gage



Lengthwise Section of the Motor Room and Basement Under It, Showing Relative Location of Air System and Motor Room Equipment

cars spotted on a track outside and parallel to the building. Billets are gaged upon delivery to the shears. An open yard billet dock has been left between the blooming mill and the company's merchant mills. It is traversed by narrow-gage tracks and a 10-ton gantry crane, made by the Whiting Corporation, Harvey, Ill.

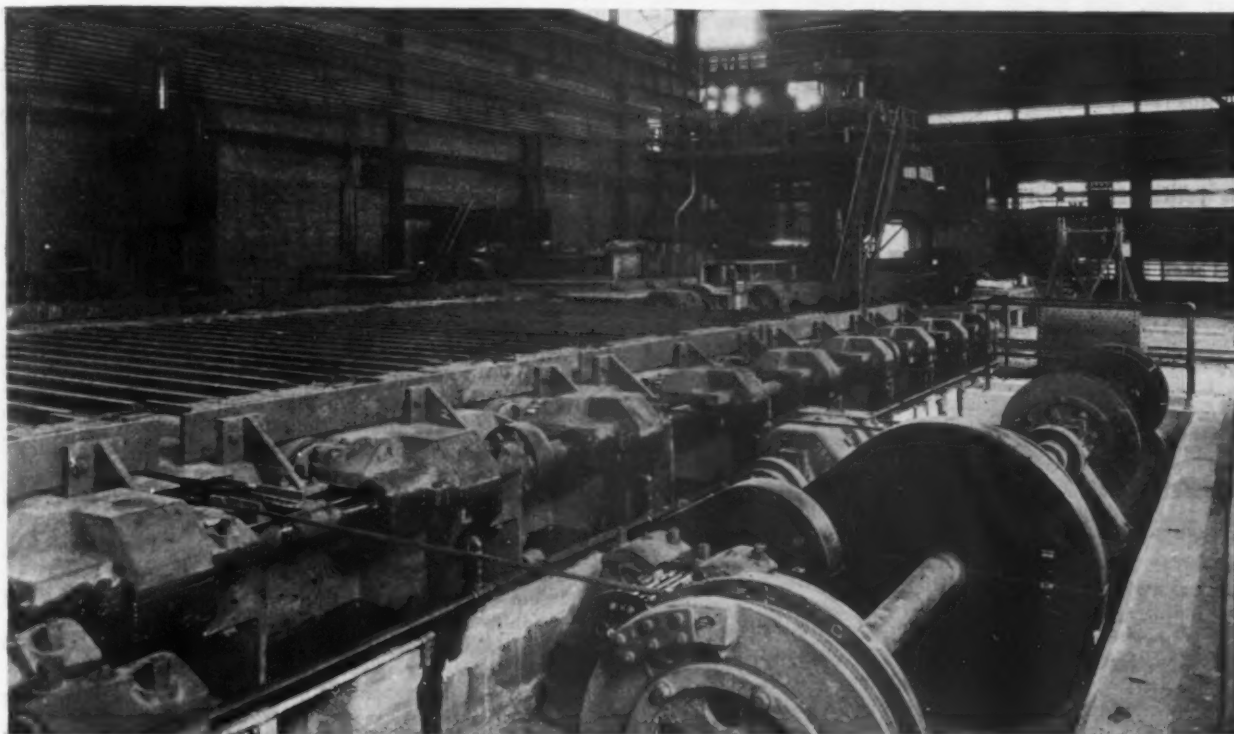
The blooming mill, complete with tables, shear and conveyors was furnished by the Mackintosh-Hemphill Co., Pittsburgh. The 50-ton overhead crane provided for the mill was constructed by the Morgan Engineering Co., Alliance, Ohio. A Mesta Machine Co. 50-in. roll-turning lathe is housed in a brick and steel room constructed on the floor of the mill. The roof is provided with a sliding door so that the mill crane can be used for handling rolls to and from the lathe.

Scale Removal Was Carefully Studied

In rolling hot steel there is an accumulation of scale which must be removed from time to time. This

later removed by a bucket attached to the overhead crane. Another scale pit is located near the transfer table end of the back feed table. Scale is washed into this pit through concrete sluiceways which extend under the front and back feed tables. The floor plates over the pit are easily removed and at required intervals the crane bucket is used to remove the accumulated scale from the pit and transfer it to standard-gage railroad cars. Beneath the transfer table is a concrete tunnel, down the center of which is a track. The scale loosened on this table drops through to the tunnel and when the accumulation has become such as to warrant removal, it is shoveled by hand to a car which is pushed to the end of the table nearest the back feed table where a grating may be taken up and the scale removed by the overhead crane.

The total length of the blooming mill, from the center line of the ingot chariot car to the outer edge of the billet conveyor is 372 ft. and the width of the building is 90 ft., the columns being spaced on 25-ft.



Transfer Cables Are On 10-Ft. Centers. In the left background can be seen the 500-lb. accumulator which provides hydraulic power for the shear gag, the jack on the lower spindle of the mill and for balancing of the upper roll

is provided for at three points in the blooming mill. The first is at the ingot-run and approach table. After the removal of the ingot from the soaking pit, scale forms rapidly and as the ingot is discharged from the chariot car to the table and passes over the first set of rolls, much of this scale is knocked loose. It falls into a pit provided for this purpose and is

centers. Steel for the building was fabricated and erected by the American Bridge Co., New York. Upon entering the building it is at once apparent that special attention has been given to ventilation, simplicity of layout to facilitate operation and maintenance, and also to provide as much daylight as is possible in a mill building used for this purpose.

Main Roll Drives

A list of motors supplied by the General Electric Co., Schenectady, N. Y., to steel, copper and similar mills for driving rolls has been compiled in that company's bulletin No. GEA-151. The list shows horsepower, temperature rise, speed, voltage, cycles, kind of mill, method of drive, date of purchase, name of purchaser and location of plant. It is in all essential particulars similar to the comprehensive list published by *Iron and Steel Engineer* last January and covering installations from all of the principal motor manufacturers. The article just mentioned formed the basis of two analyses, which were published in *THE IRON AGE* of Feb. 12, page 488, and June 25, page 1880.

In addition to the numerical list of 555 motors,

arranged in order of power, with the largest first, there are several lists similarly arranged, but segregating reversing drives from those of adjustable speed, etc., etc. A further classification is that by type of mill, lists being given of 131 merchant and bar mills, 95 sheet and tin hot mills and cold rolls, etc., down through the different types of use. Finally, there is an alphabetical list of purchasers. The bulletin, which has a few half-tone illustrations, covers 48 pages.

Dining cars on the Pennsylvania Railroad are to have aluminum chairs. The initial order was placed in Pittsburgh Sept. 24 with the Aluminum Co. of America. The use of aluminum will eliminate a fire hazard.

The Slaves of Modern Industry*

Machinery Equivalent to Millions of Serfs—Exports of Equipment Are Missionaries of Progress, Raising Living Standards Abroad

BY W. H. RASTALL

IN connection with our work, circumstances sometimes make it necessary to call it to a manufacturer's attention that the wage rates in Germany are on the level of, say, 25 per cent of our own. In England, the ratio is not quite so unfavorable but the levels are perhaps one-third of our own, while in countries like India and China, on certain classes of work, the ratio may be even one-tenth or one-twentieth of our own, and almost invariably, under these conditions, we find that manufacturers are inclined to throw up their hands and indicate that it is entirely impossible for them to face such competition, that the wage ratios are extreme, and yet statistics issued by our Government and other governments show quite clearly that manufacturers in the United States are able to export very large quantities of manufactured goods of great variety, and will even place these products in countries from which we find the strongest competition.

POWER and machinery in American industry, according to one estimate, are equivalent to more than three billion slaves.

The secret of our success in this competition is in the employment of machinery. The United States is distinguished for the economical production of goods when standardized production is possible, and in many lines, of which automobiles are an illustration, our manufacturers have been able to produce goods of superior quality at prices which cannot be approached by manufacturers elsewhere.

Consequently, we have tried to find something that would measure the value of this machinery to American industry. Recently, an opportunity of this kind occurred when a manufacturer of textile machinery visited my office and after we had discussed his particular problems, I asked him to indicate the comparison between one man in a modern textile mill operating automatic looms as compared with one man using more primitive equipment such as foot or hand power drive. This suggestion seemed to appeal to the imagination of my friend and he prepared a short historical statement for me, starting with conditions as they existed in the United States in 1804. In a loom the unit of capacity is a pick by which is made one passage of the shuttle between the threads of the warp. With a hand-power or foot-power loom, as used in this country in 1804, a weaver had a capacity of about 50 picks a minute. Today, under favorable conditions, a weaver can operate 60 looms, each having a capacity of 160 picks a minute, or a total of 9600 picks as compared with 50 as operated in this country in 1804. This works out that one weaver, today, has the capacity of 192 weavers of the earlier times or, otherwise expressed, the machinery and power in the modern weaver plant provides our men with 192 slaves apiece.

I am frank to say that when this statement was first made I was greatly impressed and when I showed this, my textile machinery friend immediately said, "Why, think of spinning," and he went on to show that one spinner in a modern textile mill, with the machinery and power available there, is able to turn out a volume of work equivalent to what would be done by

45,000 of our great grandmothers operating the hand-power spinning wheels with which you are familiar. Modern machinery provides each spinner with 45,000 slaves.

The Coolie and Modern Transportation

This method of analysis can be used in many directions. For instance, in connection with transportation, there are places in China today where goods are handled in much the same way as they were at the time of Christ, and a coolie will load a wheelbarrow and start on trips that, from our point of view, are startling. I have in mind one such journey where a coolie loaded a wheelbarrow with 300 lb. of goods, pushed it 800 miles, at the end of which journey, he brought back a similar load. The task involved two months at a cost of about \$12, which is about \$4 per 100 lb., a rate not unlike that which we pay to the railways on less-than-carload shipments to the Pacific Coast. Now it is interesting to note that this Chinese coolie receives about five cents per ton mile for his work; also he does three ton miles of work per day. If you will take the total freight handled by the Class One railroads of the United States and divide it by the total number of employees which include not only locomotive engineers but every stenographer and office boy, you will find that the equipment and power on these railroads make each employee equivalent to a very large number of these Chinese coolies, or again, each employee has many, many slaves. Unfortunately, it is not possible to pursue this subject and reach a figure that would represent the total human equivalent of all the machinery in the industries of this country, but I have seen one statement which showed that the power and machinery in American industry are equivalent to more than 3,000,000,000 slaves, and this is the factor which explains our present standard of living.

Even such a statement is entirely inadequate because no allowance is made for things that were impossible under the old method. Slaves could never do the work of the modern telephone, telegraph, or, in

ONE spinner in a modern textile mill is able to produce as much as 45,000 of our grandmothers operating their hand-power spinning wheels.

fact, any of the devices represented by modern speed. A jinriksha could never replace an automobile. The employment of power and its application to machinery in modern industry is more precious than we have ever come to realize in struggling with the problems encountered daily in our business. We enjoy a standard of living that has never been equalled in any other country or at any other time in history. In our American homes, humble though they may be, we have conveniences, as a matter of course, that would have proved to be luxuries to many of the most distinguished kings and queens of old.

The Bath Tub and Recent Progress

Have you ever heard the story of America's first bathtub? This is interesting because it shows the rapidity with which Americans have progressed in raising the standard of living. My father was born in 1840 and is still living. In 1842, a certain business

*Abstract of address before American Society for Steel Treating, Cleveland, Sept. 14. The author is chief, industrial machinery division, Department of Commerce, Washington.

man from Cincinnati went to England and while there learned that the prime minister had a bathtub. This was a very interesting discovery and on his return our Cincinnati friend decided that he too would have one of these contrivances.

On Dec. 20, 1842, the owner of this wonderful new bathtub had a party of gentlemen to dinner and as part of the entertainment four of these gentlemen tried it for themselves. This experience was so unusual that the story was published in the papers and then the fun began. Doctors attacked the bathtub on the ground of health and politicians opposed it as an obnoxious and luxurious toy from England designed to corrupt American simplicity. In 1843, the Common Council of Philadelphia considered an ordinance to prevent any such bathing between November and March. The ordinance failed by only two votes. About the same time, the legislature of Virginia levied a tax of \$30 a year on all bathtubs and in addition very heavy water rates were laid on them. The Boston council

tions. This railroad equipment is consecrated to the raising of the standard of living of the men who operate it and this has been the experience in many, many instances. In fact, it could probably be shown that the standard of living of people depends upon the extent to which they employ modern industrial, mining

IN Europe it is difficult for a laborer to secure recognition for methods or devices that his inventiveness might originate. As a consequence, large volumes of American equipment are shipped abroad.

and transportation equipment with the result that when we export machinery to various foreign countries, we are in reality exporting a better future for the population of these lands.

Asia Is Hungry for Industrialization

For many decades, the American people have been sending missionaries all over the world in order to carry the Christian religion to those populations and if you are familiar with the work of these missionaries, you will discover that in addition to their purely religious activities they are very actively engaged in educational work and medical work. Missionaries in Asia, for example, are anxious to occidentalize those people. Practically every traveler who visits Asia is filled with a feeling that something should be done to improve the conditions of life under which they struggle; and so it seems in order to remind you that when you succeed in placing a bridge, a factory full of machinery, or any other modern engineering work in those countries, in addition to merely solving an engineering problem, you are releasing forces that will have a most profound influence there for an indefinite length of time to come.

A modern bridge means modern transportation which in turn means that these people will be supported by the transportation slaves previously mentioned, and when you place a factory full of modern

YET slaves could never do the work of the telephone, telegraph or any of the devices represented by modern speed.

DESPITE low labor costs abroad, American manufacturers are able to export large quantities of their products because of the employment of machinery and standardized methods of production.

passed an ordinance forbidding the use of bathtubs except on medical advice. Such is one measure of modern progress as represented by the experience of persons still living.

This evolution is still in progress. Note the following quotation: "Since 1900 in the United States the production of pig iron per man has increased from 267 tons to 702 tons. In connection with glass, production has risen from 55 sq. ft. per workman per hour to over 3000 sq. ft. Newspapers have increased in circulation per employee over 2500 per cent. Gasoline output per employee has increased from 23,000 gallons to 75,000 gallons. In Philadelphia, certain dock equipment enables 12 men to do work that formerly required 1100. Within the memory of most of us have developed electric motors, sewing machines, babbitt metal, automatic couplers, adding machines, telephones, radio, automobiles, air brakes, pneumatic tools, the X-ray, linotype machines, vulcanized rubber, hydraulic presses, nickel and other alloys of steel, ether, celluloid, cylinder presses," and in your own field a very large number of new alloys and compositions of ferrous and non-ferrous metals.

To a very large extent all of this represents the progress of the United States. Conditions here favor development of this kind but in foreign countries this is not so. In Europe it is quite difficult for a laborer to secure recognition for methods or devices that his inventiveness might originate. Machinery salesmen find it very difficult to gain access to factories in order that they may introduce their improved equipment or methods. As a consequence, very large volumes of American mechanical equipment are shipped abroad and our machinery enjoys a reputation for superiority throughout the world.

You know, of course, that sometimes workmen have been unwilling to use improved machinery feeling that

MACHINERY does not permanently deprive the workman of his livelihood; on the contrary, it eventually raises his standard of living.

it would deprive them of their incomes, that it would take bread out of the mouths of their children, but as already pointed out, in spite of the tremendous equipment used by our railroads, we still pay substantially the same cost per ton mile of freight that is given to Chinese coolies working under more primitive condi-

machinery in one of these lands, the industry there is supported by the industrial slaves. The standard of living in these countries necessarily is raised and when such a factory is placed in the hands of some Asiatic manager, he must become quite largely occidental. The oriental mind has to change to accommodate itself to the ways of modern business. Since the armistice, Asia had purchased several hundred million dollars worth of modern factory machinery. Asia is hungry for industrialization in the modern sense. You are probably familiar with the rapid progress made by Japan in this direction during the past two or three decades. Progress in China has been much slower but during recent years the United States alone has put about \$40,000,000 worth of textile machinery into that country. India has great ambitions in this direction and while China has perhaps 3,000,000 spindles and Japan 6,000,000, India has 9,000,000 preparing the yarn from which those people shall be clothed.

Attention has been called to the profound effect upon the American mind of the scientific and industrial progress in this country during the life of persons still living. Apparently, no force can prevent a similar progress in Europe, Asia and all other countries. The introduction of these processes will enrich the lives of those peoples. These forces can be seen in operation in Japan. The standard of living there and the raise of wages have advanced most rapidly since 1900. The introduction of modern machinery, modern methods of production, and the materials that you pro-

duce will also pass on to China, India, the Dutch East Indies, and other countries that heretofore we have considered backward. Every ton of this equipment is in reality a missionary working effectively for the occi-

WHEN we export machinery, we are in reality exporting a better future for the populations abroad.

dentalization, if not the Americanization, of those people.

You are all familiar with the experience of the great war in Europe and regardless of the little incidents that might be considered the immediate cause of that great conflict, we all know that it was the outgrowth of the system or situation then existing. It is all quite clear now that this war was almost an inevitable result of the methods being pursued and yet apparent-

ly no one in any country was able to draw back and view the situation from a distance in order to detect the results that must inevitably flow from the pursuit of those policies. Perhaps it is in order to suggest that we draw back and viewing the situation thoughtfully from afar, satisfy ourselves as to the results that must accrue from the work of these steel missionaries

EVERY ton of equipment shipped to the Orient is a missionary working for the westernizing, if not the Americanizing, of the recipient.

in the United States itself, in the occidentalized countries of Europe, in the comparatively sparsely settled areas of Australia and South Africa, but especially among the oriental peoples of Asia.

Casting Composition Around Monel

Battleship Turbine Buckets Re-made in Unusual Way, to Meet a Time Schedule—
Special Dies Made for Stamping and Bending

BY BRUCE R. WARE*

THERE is a well understood adage that "necessity is the mother of invention." Undoubtedly many of the readers of THE IRON AGE have been impelled by necessity to think out new schemes for meeting emergencies.

A few months ago the writer faced an emergency. One of our battleships damaged the second stage nozzles of her main turbine. This damaged turbine blading and nozzles are shown in Fig. 1. The nozzles are formed by monel metal partition plates. These plates, as may be seen in the picture, extend into the side walls and by reference to Fig. 2 their shape and curvature will be understood. The metal holding the blades, and forming the top and bottom walls of the nozzle opening, is brass composition.

To permit the battleship to take part in the spring "war game," repairs had to be completed in less than six weeks. The best that the manufacturers of the turbine could do was delivery of parts in sixteen weeks. This could not be considered. Here necessity, emergency and an opportunity to show what we could do impelled the engineer officer and the masters of the Norfolk Navy Yard to attempt new work.

The problem was made still more difficult, as the second stage nozzles are contained in eight sections. In assembling the wheel, these sections must line up perfectly where they join together, forming one continuous bucket. The outside diameter of the stage was 5 ft. 5 1/4 in., inside diameter 5 ft. 1 1/4 in. There were 120 monel metal partition plates to be cast integral with the composition body.

A special die was made for each operation of stamping out and bending these partition plates to the required finished dimensions. To insure firm anchorage in the casting, it was decided to dovetail the plates into the body. Four finished plates are shown in the foreground of Fig. 2. The finished partition plates were sent to the pattern shop and the patterns made.

Referring to Fig. 2: In the foreground, in addition to the four plates, five spacing blocks are shown. Figs. 2, 3 and 4 show the steps of assembly of the cores and patterns. The figures are self explanatory.

But remark should be made on the five spacing blocks that are shown in place, Fig. 4. Each block fills its space entirely. The composition metal must likewise fill the space entirely and when poured must be

at the proper temperature of 2150 deg. Fahr. If the inflowing metal is too hot the monel metal partition plates would either melt (fuse) or warp; if too cold they would not be firmly grasped, and loose, chattering plates would result. The casting must be *whole*; that is, fill the space and all irregularities completely, to prevent eddy currents in the steam flow and to reduce friction losses.

This unity of casting was obtained by means of fourteen gates, two large risers and the molten lake marked "a"—"a" in Fig. 5. The first casting was awaited with much interest and it came out of the mold as shown in this figure; not much to look at, but 100 per cent good. All eight sections were successfully cast.

In this connection, at "A" in Fig. 6 and 7, will be seen a partition plate cut in two. That is the way the section actually had to be cast and, to obtain perfect alinement of divided plates, accurate spacing was necessary. If the entrance side, Fig. 7, of this divided plate did not meet perfectly with the exit side, Fig. 6, an uneven, low-efficiency nozzle would result.

Eight sections were cast without one failure.

Yates-American Woodworking Machinery Merger

The American Wood Working Machinery Co., Rochester, N. Y., and the P. B. Yates Machine Co., Beloit, Wis., two of the largest firms engaged in the manufacture of woodworking machines in this country, have been combined to form the Yates-American Machine Co., with headquarters at Rochester. J. E. McKelvey, president of the American Wood Working Machinery Co., since its organization in 1901, will be president of the new company and P. G. Farrow, vice-president of the Yates Co., will be vice-president. The new board of directors will be composed of representative men from both concerns, including H. A. Perkins of Rochester and Earle L. Hart of Chicago. The American Wood Working Co. was itself the result of the merger of a dozen smaller plants in 1901 while the P. B. Yates Co., organized in 1884, owns the P. B. Yates Machine Co., Ltd., of Hamilton, Ont. No change in operation of the plants is contemplated at present.

*Commander, United States Navy, engineer officer and outside superintendent, Navy Yard, Norfolk, Va.

Showing Methods Used in Casting Around Monel Metal

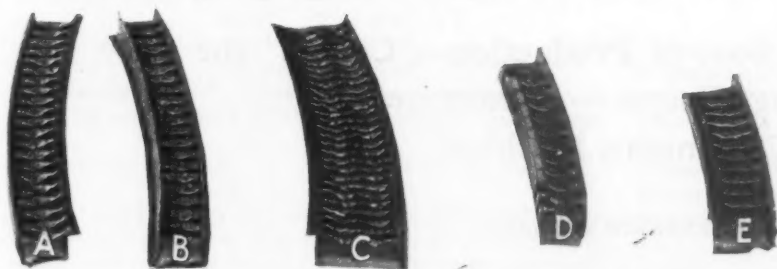


Fig. 1 (Left)—Damaged Turbine Blading. A and B—First wheel, first stage. C—Second wheel, first stage. D—Second stage. E—Third stage

Fig. 2 (Right)—A—Second Stage Nozzle Core Box. B—Second stage nozzle pattern. Partition plates and spacing blocks in foreground

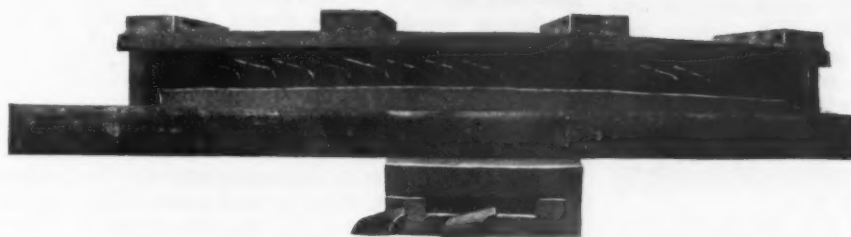
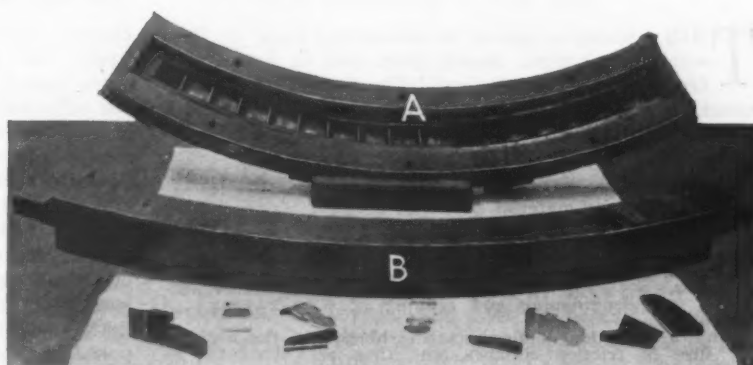


Fig. 3 (Left)—Second Stage Nozzle Core in Core Box



Fig. 5—Second Stage Nozzle Casting with Risers and Gates. "Lakes" of metal at "a, a" aided in feeding

Fig. 4 (Below)—Second Stage Nozzle Core with All Monel Metal Partition Plates and a Few Spacing Blocks in Place

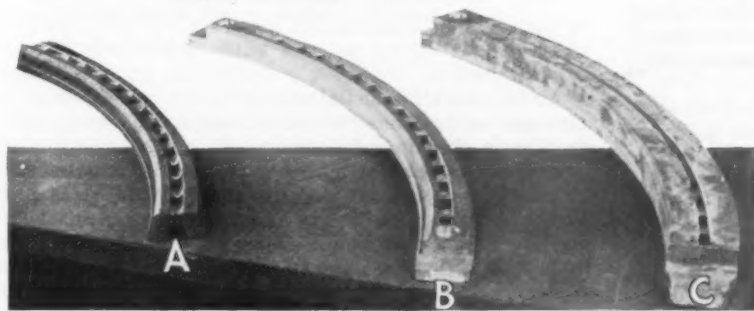
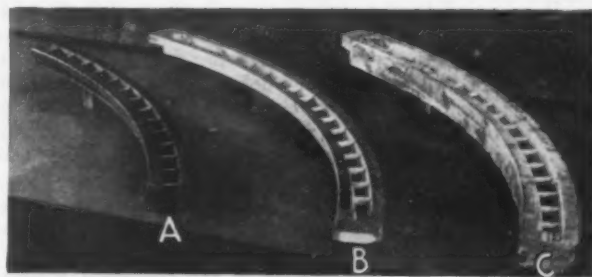


Fig. 6 (Left)—Steam Exit Side of Second Stage Nozzle. A—Damaged nozzle section. B—Finished nozzle section before cutting to exact length. C—Rough casting with risers, etc., removed

Fig. 7 (Right)—Steam Entrance Side of Second Stage Nozzle. A—Damaged nozzle section. B—Finished nozzle section before cutting to exact length. C—Rough casting with risers, etc., removed



Increasing Wire-Drawing Speed

Its Relation to Cost of Production—"Chores" the Governing Factor—Advantages of Continuous Machine

BY KENNETH B. LEWIS*

THIS discussion relates to low-carbon basic or Bessemer steel wire, drawn from one to five drafts from No. 5 gage wire rod. The matter of drawing speed, originally of no importance, has been gradually pushed to the front by the following successive advances in the art:

1. Adoption of Bessemer steel—a strong and homogeneous material.
2. Increase in weight of rod bundle by the successive adoption of three-high, Belgian and continuous rolling for wire rods.
3. Improvement of coating, lubrication and dies.
4. Strengthening and refining of wire-drawing machinery.
5. Adoption of slow starting blocks, by the use first of friction clutches, and then of individual motors.
6. Mechanical stripping.
7. Continuous drawing of coarse wire.

The object of speed in wire drawing is partly to reduce investment, but chiefly to reduce labor cost by increasing output per man. Whether or not drawing speed affects output per man is a question that has given rise to more vigorous debate than any other wire mill problem. In the main, the answer dictated by logic and by experience has been NO.

Wire drawing may be divided into two parts. One part is a series of non-productive jobs such as placing the rod bundle on the reel, pointing, drawing out an end, gaging, stripping the blocks, tying up and loading finished wire, etc. The other part is the actual running of the wire through the die. The non-productive operations can be conveniently referred to as the "chores." The number of bundles for which a wire drawer can perform, in the course of a day, the series of chores necessary to get that wire to the desired size, is the number of bundles he can draw. Drawing speed, while it affects the number of drawing units used, obviously has no effect on the number of times the standard round of chores can be performed, nor therefore on the output per man.

This is the logic of the situation, and it checks perfectly with experience. It has been repeatedly shown that the average output of a man running five blocks at 65 r.p.m. is the same as that of a man running eight blocks at 40 r.p.m.

In spite of logic and experience the fact that the relation between drawing speed and output per man has never been actually pinned down to cold figures leaves the matter decidedly foggy, and permits an occasional fallacy to creep in. This has been noticeable in recent years, since direct motor drive, both of individual wire blocks and of continuous machines, has removed one of the obstacles to high drawing speed.

Saying It with Symbols

It occurred to the writer recently that, if logic and experience were trustworthy, it ought to be possible to express the relation between drawing speed and output per man, or the absence of such relation, in the form of an equation. The difficulty of reducing wire drawing to mathematical terms is painfully apparent. A man's output is dependent chiefly on the time spent on the chores. The time required for the chores varies considerably, and the difficulty of even separating them one from another for the purpose of time study is considerable.

A further complication lies in the fact that a wire drawer is often under no pressure to speed up the

chores, because he knows that he cannot stand up under the physical strain of lifting and handling more than a definite amount of wire a day. The number of pounds of wire of any coarse size, multiplied by the number of lifts necessary in its production, is practically constant at 30,000. If he does the chores quickly it is only because he would rather spend his surplus time entirely idle than to divide it among leisurely conducted non-productive operations.

Fortunately, the continuous wire-drawing machine offers a more convenient approach to time study. In such machines the stripping of unfinished wire is eliminated and the wire drawer, freed from the limit imposed by his physical endurance, can cash in on alertness and economy of movement. In the operation of continuous machines the chores are bunched in such a way as to be more easily timed and charted and the operator realizes that he has a direct financial interest in reducing them to the minimum.

On a Semi-Continuous Machine

The writer has been concerned with the development and marketing of a type of semi-continuous wire machine which produces coarse sizes from the No. 5 rod. He has not only collected much data relative to productive and non-productive operations, but has had ample opportunity to check conclusions drawn from such data against sustained average production. The number of wire-drawing units (whether blocks or machines) operable by one man is equal to the time of the operating cycle divided by the sum of the times of all the chores. Expressed mathematically, this relation is

$$N = \frac{R+T}{T+P+B}$$

Where N = Number of units;
 R = Minutes required for the run-off of one bundle;
 T = Minutes required to thread;
 P = Minutes required to put bundle on reel and make point;
 B = Minutes required to tie up and load finished wire.

In the machine mentioned, stripping is mechanically done as an incident to the threading operation, and its time is therefore included in T . The arranging of a new rod bundle on the reel or the flipper, and the making of a point, are done while the machine is producing at full speed, as are also the tying up and loading of the finished wire. Hence $R+T$ represents the full cycle, from the start of one bundle to the start of the next. If these chores interrupted production, as in the case of standard equipment, they would go into the numerator of the fraction, which then would become

$$N = \frac{R+T+P+B}{T+P+B}$$

The two factors included in output per man are (1) number of machines and (2) quota per machine, which we will indicate as Q . The number of minutes in the working day (M), divided by the minutes in the cycle ($R+T$) gives the number of bundles produced per day, per machine, and this figure multiplied by the weight of one bundle (W) gives the daily quota of a machine, thus

$$Q = \frac{MW}{R+T}$$

*Morgan Construction Co., Worcester, Mass.

If we multiply the number of machines per man by the amount produced per machine per day we get the amount produced per day per man.

Multiplying $\frac{R+T}{T+P+B}$ by $\frac{MW}{R+T}$, we find $R+T$ as a factor in both numerator and denominator and cancel it out. The resulting formula for output per man per day is $\frac{MW}{T+P+B}$. In other words, the product of length of day and weight of bundle, divided by the total time of the "chores" in the production of a single bundle of any finished size, is the output per man

per day for that size. The formula, by construction, is of universal application.

Speed Not Involved

The most notable thing about this formula is that it contains no term which in any way expresses drawing speed. It justifies absolutely the contention that there is no connection between speed and production per man. The absence from the formula of any term related to number of blocks per man, together with the absence of any term relating to speed, proves that the product of drawing speed and number of blocks is a

(Concluded on page 1084)

Abrasive Dust and Lung Trouble

X-Ray Photographs of Norton Employees Fail to Show Ill Effects from Continuous Inhalation of Dust from Artificial Abrasives

DEDUCTIONS at sharp variance with accepted beliefs were drawn from the first X-ray study of the effect of abrasive dust on workmen, conducted by the medical department of the Norton Co., Worcester, Mass. The purpose was to establish as definitely as possible whether, under modern factory conditions, these sharp particles produce pneumonokoniosis, which is the medical name for a condition of the lung tissue that cripples the functions of the organ and invites chronic disease, particularly tuberculosis. The story of the tests and their results has been told in the *Journal of Industrial Hygiene* in a paper by Dr. W. Irving Clark, head of the Norton service department (which includes the medical department), and his associate, Dr. Edward B. Simmons. Their conclusions, which upset a commonly accepted belief, follow:

1. In factories which provide proper methods of dust removal, the continuous inhalation of artificial abrasive dust, extending over many years, does not produce the symptoms or present the X-ray findings of pneumonokoniosis.

2. The number of cases of pulmonary tuberculosis occurring in the artificial abrasive industry does not greatly exceed the number normally present in the community.

3. Workers who habitually use grinding wheels will run but slight risk of developing pneumonokoniosis if they use artificial abrasive rather than sandstone wheels for all grinding operations, and if the machines upon which the artificial abrasive wheels are mounted are properly hooded and excessive dust removed by suction fans.

Tests Under Extreme Conditions of Exposure

The investigators were not content with taking as their subjects for study men working in shops and factories using abrasives in processes of manufacture. Instead they selected 79 men of the Norton plants who had been engaged more than 10 years in the manufacture of abrasives and abrasive wheels, under conditions of exposure to dust-laden air as extreme as they could be where modern exhaust systems were in operation. These men were subjected to a searching physical examination, their physical histories were secured, and comprehensive X-ray photographs were taken of their lungs.

The X-ray plates were read by Dr. D. C. Jarvis of Barre, Vt., consultant Department of Industrial Hygiene, United States Public Health Service, and medical advisor Granite Cutters' International Association of America. Doctor Jarvis has spent many years taking and studying X-rays of silicotic chests, i.e. chests where the normal lung tissue has been replaced by fibrous tissue through the action of silica dust.

What Examination of Subjects Disclosed

The age of the 79 men ranged from 31 to 68 years, the average being 32½ years; and their service from 11 to 38 years, the average being 17 1/8 years. The physical examination showed that 60 of them were well developed and nourished, 14 were fairly well developed, five poorly developed. Their average weight was 154½

lb., which is high. Five of them at some time had had bronchitis, 54 coryza, and five an occasional cough. Forty-nine had entirely escaped influenza, 60 tonsillitis, 75 laryngitis, 55 pharyngitis, 60 the grippe, 73 pleurisy and 75 pneumonia. Conditions under which these men had worked for so many years are described in the paper, as follows:

This study is clinical in character and represents 14 years' experience in the largest single abrasive and grinding wheel factory in the world. The average number of employees during the period has been 2100, but only about one-fifth of this number have been exposed to the inhalation of large quantities of dust.

In the manufacture of abrasive and grinding wheels there are four departments in which the processes are very dusty. These are the abrasive department where the lumps of abrasives are crushed into grain and sized; the shaving department where the dry wheels, still in clay form, are shaped on a special type of potter's wheel; the truing department in which the now vitrified wheels are cut to exact size on specially constructed lathes; and the clay department where the clays which make up the bond in the wheels are weighed and mixed. The dustiest of these departments is the last. In all departments where abrasive dust occurs, very complete dust removal systems have been in operation for years, and at present the amount of dust collected by this system daily is 12,000 lb.

Only One Out of 79 Men Affected

Doctor Jarvis' study of the X-ray plates led him to the conclusion that only one of the 79 men showed signs of silicosis and this was in the incipient stage. To quote the paper further:

This worker was employed in the clay plant, where there is no artificial abrasive dust, but a great deal of clay dust. Analysis of the clay showed that it contained 9 per cent of pure silica which is introduced in the form of feldspar. This is, therefore, probably a case of true, early silicosis.

The chest pictures of the workers exposed to artificial abrasive dust showed lungs which had, in no case, typical signs of silicosis, though in four cases there was evidence that the lungs were working hard to keep themselves clear of dust. Doctor Jarvis felt that if these were the lungs of granite workers, they would represent a perfectly safe risk for an indefinite time. It was also his opinion that, with the exception of the man exposed to clay dust, none of our men would develop active symptoms of pneumonokoniosis during their natural lives.

Many studies have been made of the effects of the inhalation of silica dust produced by grinding with sandstone wheels or in mining, but, with the exception of an investigation made in 1923 by Dr. E. L. Middleton, no examination of grinders using wheels made of artificial abrasive has been recorded.

Middleton divides fibrosis (the substitution of fibrous for normal tissue in the lungs) into three degrees. In his examination of 58 grinders using machine manufactured wheels, three showed symptoms or had physical signs of first-degree fibrosis. None had symptoms or signs of second-degree or third-degree fibrosis. On the other hand, of 269 wet sandstone grinders, 217 had some form of fibrosis—159, first-degree fibrosis; 50, second-degree, and eight, third-degree.

To Discuss Relations of Selling and Advertising

Cutting the high cost of selling "by applying common sense methods to advertising and advertisements" is announced as the central theme of the fourth annual convention of the National Industrial Advertisers Association to be held at the Hotel Chalfonte, Atlantic City, N. J., Oct. 19, 20 and 21. Among the addresses scheduled are the following:

Quick Refunding Investments—E. P. Blanchard, advertising manager Bullard Machine Tool Co. (Monday morning).

The Advertising Manager as Purchasing Agent—Capt. M. F. Behar, advertising manager, C. J. Tagliabue Mfg. Co. and The Tie-Up Between Advertising and Sales Departments. T. H. Dauchy, assistant sales manager, International Nickel Co. (Monday afternoon).

Securing Facts and Figures from the Field and How to Use Them, by R. H. DeMott, general sales manager, S. K. F. Industries (Tuesday morning).

Notable Advertising Successes of 1925—W. W. French, advertising manager Dodge Mfg. Co.; G. L. Erwin, advertising manager Kearney-Trecker Corporation and R. W. Bacon, U. T. Hungerford Brass & Copper Co. (Tuesday afternoon).

The Use of Color in Industrial Advertising—S. T. Scofield, advertising manager, Fairbanks, Morse & Co. and L. C. Hewins, sales manager, Van Dorn & Dutton Co.; **Apportioning the Appropriation Among Industrial Markets**—A. M. Staehle, Westinghouse Electric & Mfg. Co.; **Export Industrial Advertising**—L. Emery, assistant general manager, International General Electric Co. (Wednesday morning).

Industrial Motion Pictures—How To Use Them—G. A. Richardson, manager technical publicity department, Bethlehem Steel Co. (Wednesday afternoon).

Fall Meeting on Refractories in New York

The fall meeting of the American Refractories Institute will be held at the Waldorf-Astoria hotel, New York, on Oct. 29, beginning at 10 a. m. Of especial interest to consumers of refractories will be the part of the program dealing with specifications. The research division of the refractories fellowship at Mellon

Institute, working in cooperation with advisory committees of technical men, is making a critical study of the existing tests for refractories and accumulating data on furnace conditions so that satisfactory specifications can be written. An outline of the plans that have been made for such work will be given and a progress report made. Non-members are invited to attend.

Series of Tests for Concrete Reinforcement Recommended

A comprehensive series of tests, the results of which may serve as a basis for formulating specifications for concrete reinforcement was recommended in a resolution unanimously adopted at the semi-annual meeting of the Concrete Reinforcing Steel Institute, held at Chicago, Sept. 23.

Another resolution unanimously carried instructed the executive committee of the institute to cooperate in making these tests, to investigate their cost and to recommend ways and means for their execution. The institute also voted to hold its next annual meeting at Atlantic City, N. J., in March, 1926.

Degree Conferred on Judge Gary

Elbert H. Gary, chairman United States Steel Corporation, New York, received the honorary degree of Doctor of Commercial Science from New York University, on Oct. 8, his seventy-ninth birthday. In conferring the degree upon Judge Gary, Dr. Elmer Ellsworth Brown, chancellor of the university, said:

Elbert Henry Gary, farmer boy, college man, jurist, some time public official and at all times influential in public affairs, conspicuous among the makers of the Age of Steel, exponent of a commercial and industrial system which, whatever its limitations, has forcefully advanced the prosperity of America and of the citizens of America, and has multiplied her power to serve mankind; on a colossal scale you have directed into ways of useful service that scientific discovery and invention which has become the daily food of our modern life.

Controversy Forecast Over Trade Commission Appointment

WASHINGTON, Oct. 9.—Reappointment by President Coolidge recently of C. W. Hunt, of Iowa, as a member of the Federal Trade Commission has given rise to a report that his confirmation will be a subject of controversy by the Senate at the next session of Congress and will precipitate general discussion as to the new policy of the commission. Curiously enough Commissioner Hunt, who was associated with the Iowa Farm Federation Bureau, was named originally as a progressive Republican and was apparently selected as sympathetic not only with the so-called agricultural bloc but also with the progressive bloc. These same interests, it is claimed, will oppose his reappointment because he has lined up with the other two commissioners, Vernon W. Van Fleet and William E. Humphrey, in bringing about the change in the policy of the commission, which is considered to be more conservative and agreeable to business interests of the country than its previous policy. The change was opposed by the two Democratic members, Commissioners Thompson and Nugent.

It is believed, however, that the new policy, adopted since the adjournment of Congress, will in the end be approved by the latter and that the confirmation of Mr. Hunt will be brought about. At the same time a lively fight is predicted against his confirmation and perhaps will be headed by Senator Norris, progressive Republican of Nebraska. It is believed that the fight may take the form of renewed efforts by such senators and Mr. Norris for abolition of the commission, but such an attempt, it is thought, will prove unsuccessful.

COMING MEETINGS

October

American Management Association. Oct. 15 and 16. General convention, Hotel Astor, New York. W. J. Donald, 20 Vesey Street, New York, managing director.

National Industrial Advertisers Association. Oct. 19 to 21. Annual meeting, Hotel Chalfonte, Atlantic City, N. J. W. A. Wolff, 195 Broadway, New York, chairman convention committee.

American Welding Society. Oct. 21, 22 and 23. Fall meeting, Massachusetts Institute of Technology, Cambridge, Mass. M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

American Iron and Steel Institute. Oct. 23. Twenty-eighth general meeting, Hotel Commodore, New York. E. A. S. Clarke, 40 Rector Street, New York, secretary.

November

American Institute of Steel Construction. Nov. 11 to 14. Annual convention, White Sulphur Springs, W. Va. Charles F. Abbott, 350 Madison Avenue, New York, executive director.

American Society of Mechanical Engineers. Nov. 30 to Dec. 3. Annual meeting, Engineering Societies Building, 29 West Thirty-ninth Street, New York. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

National Exposition of Power and Mechanical Engineering. Nov. 30 to Dec. 5. Grand Central Palace, New York. Charles F. Roth, International Exposition Co., Grand Central Palace, New York, manager.

Ferric Oxide in Steel Making

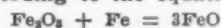
Its Function in Acid and Basic Open-Hearth Practice—Variable Bath Conditions— Gas Oxidation

BY J. H. WHITNEY*

IN order to purify the bath of steel and bring it to the required composition oxygen is essential. Two sources of supply are available in the open-hearth processes, namely, iron oxide added as ore and the mixture of air and producer gas constantly passing through the furnace. It is chiefly with the latter source that the following remarks are concerned.

To begin with, the use of the term ferric oxide in the present paper requires a little explanation for it is not a stable compound, under atmospheric pressure, at the temperatures attained in a steel furnace; at 1350 deg. C. it changes to a magnetic oxide with a less oxygen content. For practical purposes, the latter may be regarded as a compound of ferrous and ferric oxides (FeO , Fe_2O_3), and since these two oxides are alone determined by analysis, the iron in the slags will here be considered to exist as either the one or the other.

It is important to note in the first place that Fe_2O_3 is readily reduced to FeO at high temperatures by metallic iron according to the equation—



The reaction, however, does not proceed to completion although the equilibrium constant probably increases with the temperature. Evidence of this reaction is not difficult to obtain. Thus Tritton and Hanson recently melted nearly pure Fe_2O_3 with some electrolytic iron at about 1530 deg. C. and after the iron had been molten for two minutes the oxide had the following analysis:—

	Per Cent
FeO	86.0
Fe_2O_3	14.0

Previously the author had made a similar experiment by packing a mixture of electrolytic iron drillings and a pure scale containing 26.0 per cent of ferric oxide in a small tightly plugged cylinder of Armeo iron and heating it for two hours at about 1350 deg. C. The resulting fused oxide then showed on analysis:—

	Per Cent
FeO	92.0
Fe_2O_3	8.0

The reaction was also seen to occur in another experiment in which a small piece of electrolytic iron was immersed in a quantity of iron cinder consisting of SiO_2 30 per cent, FeO , Fe_2O_3 70 per cent which had been melted in a platinum crucible in an oxygen furnace, at about 1400 deg. C. On rapidly cooling the melt after 15 min. heating, no trace of metallic iron was to be found in it.

This reduction by iron of Fe_2O_3 clearly enables the latter to function as a carrier of oxygen, since the FeO formed is readily oxidized again. Obviously, under suitable conditions, the process may continue indefinitely and it is the purpose of the present paper to lay emphasis on this particular effect in so far as it operates in the acid and basic open-hearth processes.

The Acid Process

Direct evidence of the reaction under consideration is often to be obtained in the acid process during the finishing stages, after the bath has dropped off the boil, especially if the iron content of the slag is above 20 per cent. While a vigorous boil is in progress the Fe_2O_3 in the slag remains well under 0.50 per cent; even a heavy feed of ore does not appreciably alter it. But as the carbon drops below about 0.20 per cent, the Fe_2O_3 begins to increase and may reach 3 per cent.

*From a contribution to a general discussion on "The Physical Chemistry of Steel-Making Processes," held by the Faraday Society and the Iron and Steel Institute, in London, Monday, June 8.

At the same time a steady rise in the total iron content of the slag generally occurs without any further additions of ore being made. Table I is an example:

Table I Slag							Metallic Globules, Per Cent
Carbon in Bath, Per Cent	Fe, Per Cent	FeO , Per Cent	Fe_2O_3 , Per Cent	MnO , Per Cent	SiO_2 , Per Cent		
0.30	23.6	30.1	0.25	11.6	53.5	0.30	
0.20	23.3	29.3	0.50	...	...	0.10	
0.15	23.9	29.5	1.20	...	...	...
0.10	24.5	29.6	2.10	...	...	...

The effect here illustrated, namely, the gradual increase in the percentage of iron in the slag as oxide, must be due to the transference of oxygen from the gas to the metal by means of the Fe_2O_3 , for no other reaction which would bring about this result appears possible. Although the silica is in excess of that needed to form the bisilicate (2RO , SiO_2) of iron and manganese and far in excess of that required to produce the monosilicate (2RO , SiO_2), it seems clear that a certain amount of dissociated FeO must exist in the molten slag. At the surface this is converted into Fe_2O_3 by the oxidizing gases in the furnace, and on coming into contact with the metal below is partly reduced again to FeO . The result of this continual oxidation and reduction will be an increase of the iron content of the slag during the finishing period as illustrated in the above example.

There can be little doubt that, throughout the boiling period, Fe_2O_3 thus constantly functions as a carrier of oxygen, since 50 per cent of the carbon may be removed by gas-oxidation in normal working. Accumulation of Fe_2O_3 and increase of iron in the slag are prevented, at this stage, however, by the velocity of the carbon reaction, due in part to the passage in and out of the slag during the boil of great numbers of minute metallic globules. The amount of metal then held in suspension may be as much as 5 per cent by weight of the slag. There is evidence to show that if the oxidation of the carbon could be effected in a neutral atmosphere, with an iron silicate slag only, the boiling period would be greatly lengthened. Thus gas-oxidation by the agency of Fe_2O_3 accelerates the process, although it does not, like ore-oxidation, improve the yield.

Basic Process

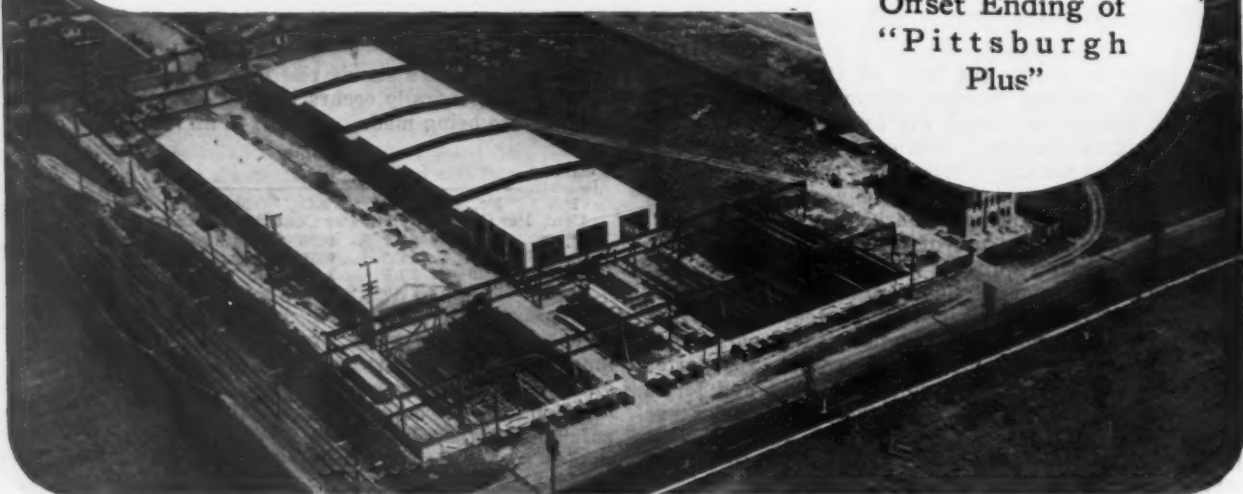
In the basic process the same effects are to be observed to a still greater extent, notwithstanding the fact that the iron content of the slags may be as low or even lower than 6 per cent. During the refining period the ratio of Fe_2O_3 to FeO is invariably much higher than in the acid process. An example showing the Fe_2O_3 content and its increase during the working of a 60-ton charge is given in Table II. The samples were taken at regular intervals and it will be seen that a considerable proportion of the iron existed as Fe_2O_3 in all of them.

Table II Slag Analysis									Metallic Glo- bules, Per Cent
Carbon in Bath, Per Cent	Fe_2O_3 , Per Cent	FeO , Per Cent	MnO , Per Cent	CaO , Per Cent	MgO , Per Cent	SiO_2 , Per Cent	P_2O_5 , Per Cent		
0.80	0.85	5.8	6.75	42.3	3.23	24.8	8.01	0.56	
0.70	1.0	4.9	5.26	49.1	6.8	20.4	7.38	0.7	
0.52	2.0	7.7	4.56	50.6	6.4	18.2	7.74	1.3	
0.24	2.3	9.1	4.41	51.6	6.31	16.0	6.83	2.5	
0.145	3.1	9.5	4.18	52.9	6.17	15.6	6.56	0.3	
0.09	3.4	10.4	4.2	51.7	5.91	14.6	6.56	0.5	
0.13	3.0	11.4	3.9	52.0	5.87	14.3	6.0	0.25	
0.165	3.0	11.8	4.5	51.4	5.91	15.3	5.76	tr.	

(Continued on page 1083)

Pacific Coast Fabricating Plant

Expansion of McClintic - Marshall
Operations to
Offset Ending of
"Pittsburgh
Plus"



Aerial View of the Plant

WITH the completion and starting of its new plant at Los Angeles, the McClintic-Marshall Co., Pittsburgh, has welded the last link in a chain of steel fabricating shops that begins at the Atlantic Seaboard and ends at the Pacific Coast. The company not only is the largest independent fabricator of steel in the United States, but with shops at Pottstown, Pa., and Baltimore, in the East, at Rankin, Carnegie and Leetsdale, Pa., in the Pittsburgh district; two plants in Chicago and the new one at Los Angeles, it enjoys locations that make nation-wide the scope of its business activities. This is not a minor consideration since the formal abandonment, Sept. 22, 1924, of Pittsburgh as a sole basing point for steel prices by the Steel Corporation at the behest of the Federal Trade Commission. The McClintic-Marshall Co. was

threatened with localization of its business by the passing of the Pittsburgh plus method of steel quotation. To escape such restriction it acquired late last year the plants of the Kenwood Bridge Co., and the Morava Construction Co., in Chicago and then started building the Los Angeles plant.

The latter plant, located on a tract of several acres at 110th Street and Central Avenue, has capacity for fabricating 1500 tons of steel monthly. As might be expected in a modern plant, where other considerations did not interfere, the plant was so laid out that the plain material goes through the fabricating shop with no backward movements. The plant consists of two buildings. The main one, which houses the fabricating equipment, is 90 ft. x 350 ft., of Aiken type, high and low bay construction, of structural steel sheathed with



Recognizing the Importance of Good Light in the Template Shop



Plain Material Comes in on a Spur of the Pacific Electric Railway to the Receiving Yard, Served by 10-Ton Double-Trolley Crane

corrugated sheet iron and lighted and ventilated by steel sash windows.

Material from the mills is received under an overhead traveling crane runway and from there is moved through its several operations for shearing, punching, drilling, riveting, etc., on industrial tracks until it reaches the shipping yard, which also is under an overhead traveling crane runway passing the end of the shops and over the railroad siding. All handling of material is by electrically controlled overhead cranes or hoists and all machines are direct connected, motor driven. The riveting machines are compressed air horseshoe type, stationary and swinging.

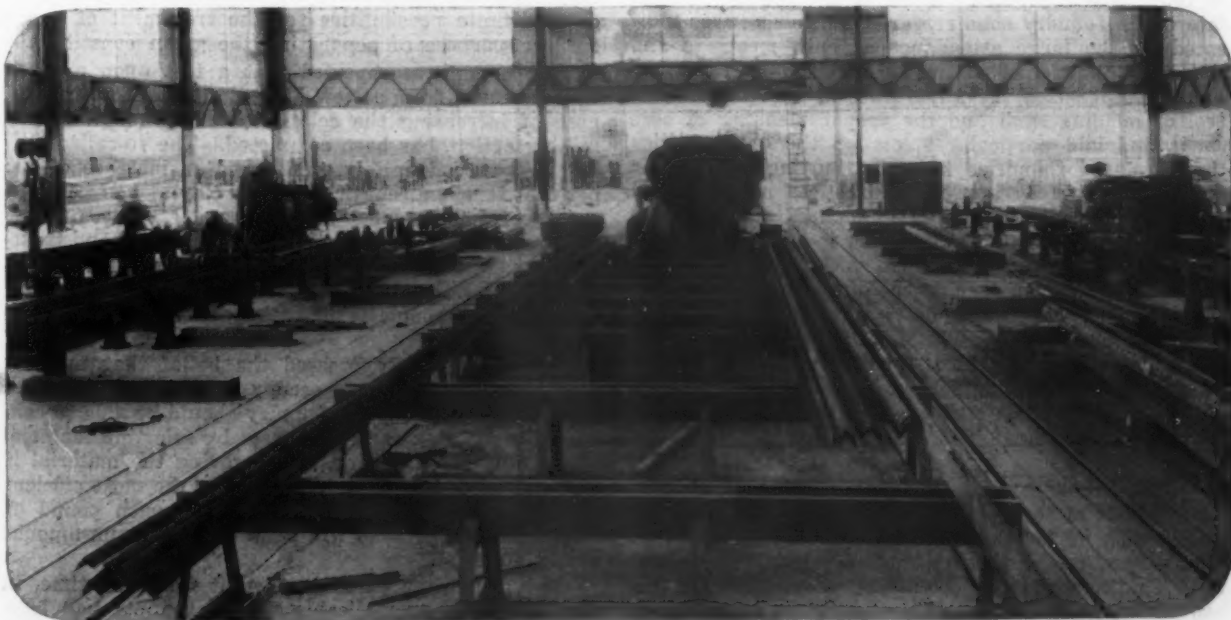
In the other building, which is 60 ft. x 250 ft. and parallels the main shop, are the templet shop, machine shop, rivet making and smith shop and other subordinate departments.

The receiving and storage yards each are 80 x 300 ft. Sidings of the Pacific Electric Railway run into both ends of the plant, which incidentally is only about 12 miles from the Los Angeles waterfront. This is

an important consideration, seeing that the company will receive a good deal of its plain structural steel by water.

The new unit is known as the McClintic-Marshall Co. of California, with C. D. Marshall, Pittsburgh, president; H. H. McClintic, Pittsburgh, secretary, and W. B. Kyle, Los Angeles, resident vice-president. F. C. Todd, Jr., is manager of works.

A team representing the Zanesville, Ohio, works of the American Rolling Mill Co. recently won the world's championship in first-aid proficiency in the international contest at Springfield, Ill., with a score of 99.04 per cent. The winning team competed against 62 teams from the United States and Mexico and gained permanent possession of a Congressional medal awarded by act of Congress. Each member received a gold medal from the National Safety Council and a bronze medal, designed by Gutzum Borglum, from the American Red Cross.



At the End of the Shop Nearest the Receiving Yard Is Located the Punching and Shearing Equipment

Foundrymen Hear Over 60 Papers

Sessions on Sand Problems and Foundry Costs the Features at Annual Convention of American Foundrymen's Association—Large Exhibition Reveals New Equipment

DESPITE conditions which were decidedly unfavorable, the twenty-ninth annual convention and exhibition of the American Foundrymen's Association at Syracuse, N. Y., last week, Oct. 5 to 9, was one of the most successful yet held. Housed in buildings of the New York State fair grounds some three miles from the leading hotels, with the weather cold and rainy much of the time, there was considerable discomfort for both exhibitors and those attending technical sessions. Efforts to overcome the cold were partially successful. Enthusiasm persisted, however, so that the attendance at the sessions and the exhibits measured up to some of the best gatherings in the history of the organization. Compared with recent conventions, the registered attendance was large. This year the total was about 3350 as against 4200 in Milwaukee last October and 3425 in Cleveland in May, 1923. The Rochester convention in the spring of 1922 had a record of only 2400. More firms sent representatives a distance of 50 miles and over than at any recent gathering.

The technical program was of a very high order and the exhibits some of the most impressive ever displayed at these gatherings. The international feature was again emphasized by the presentation of British and French exchange papers and the presence of a distinguished British foundryman.

Varied Program of Technical Papers

SEVENTEEN sessions, including the annual business meeting, most of them simultaneous with others, were well managed and well attended. More interest was displayed this year than last and the average attendance at all the sessions was the largest and most enthusiastic in several years—despite conditions in the meeting rooms which were unfavorable to successful presentation or discussion. All branches of the foundry industry were fully covered by a program pronounced by many as one of the best in several years. There were over 60 technical papers and committee reports. The features, both as to importance and attendance, were the sessions on sand and on foundry costs. Three non-ferrous sessions, with a round table luncheon discussion, the first ever held at a foundrymen's convention, were successfully put through by the Institute of Metals and the foundrymen. Only brief abstracts and the chief points in the discussions are possible in the following report:

Large Interest in Foundry Sand Problems

TWO sessions were devoted to foundry sands, one largely to the report of committees and the other to four papers on sand control in the foundry. That interest in foundry sand research is growing was indicated by the large attendance at both meetings and the active participation in discussions. Writers of papers emphasized the importance of the proper control of molding sand and the proper blending of core sands and laid particular stress on the opportunities they declared foundries have for cutting down their production costs by improving practices in their sand departments. The chairman announced that a new committee had been formed. This is a sub-committee on grading sand and its object will be to suggest a standard method of grading molding sands.

The joint committee on molding sand research through the chairman, W. M. Saunders, Saunders & Franklin, Providence, R. I., made a progress report. This showed that considerable new work had been taken up during the year in addition to carrying on the work previously started.

Conservation and Reclamation

A report of the sub-committee on conservation and reclamation of foundry sands was presented by R. F. Harrington, metallurgist Hunt-Spiller Mfg. Co., Boston. This committee reported that since the Milwaukee convention many conservation and reclamation tests have been inaugurated. At a meeting in May tests were inaugurated in an endeavor to determine the de-

sirability of attempting further tests upon the separation of the various grain constituents in foundry waste sands. As far as it has been carried out the test indicates definite possibilities for the treatment of sands for the purpose of separating the grain constituents.

The committee reported that a test upon a spent clay, removed from a New Millville gravel for the purpose of increasing the colloidal value through proper milling action, has been completed. The so-called Colloid mill used definitely established an increase of 157 per cent tensile strength upon new clay and 27 per cent on clay from the spent molding sand. The committee felt that in view of these tests this phase of sand treatment, making possible increased effectiveness of bonding material through greater development of the colloidal matter, should form an important part of future investigation.

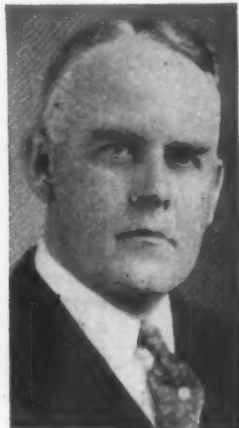
The committee expressed the belief that molding sand conservation should occupy first place in its work for the coming year. A foundry should be able to conserve its molding sand purchases by selecting material best suited for the work, by improving the material if it is not the best suited, by providing the most efficient means of preparing the sand so that each pound of new sand or new bond will bond the maximum amount of old material.

The committee pointed out that for some time, in the gray iron or malleable fields, attempts had been made to use molding sand substitutes in the way of various clays or highly bonded sands. While this sub-

New Officers for 1925-1926



A. B. ROOT, JR.
President



S. W. UTLEY
Vice-President



C. E. HOYT
Secretary-Treasurer

stitution in the gray iron field has been conducted for some time in an experimental or semi-experimental way, it is only in the last year or two that any general progress has been made on a practical shop basis. Many favorable reports have recently come from foundries employing sand substitutes. These reports show that some foundries have operated from three months to a year without adding new sand and others have greatly reduced the amount of new sand.

Substitutes for Molding Sand

Introduction of substitutes for molding sand has brought out the effectiveness of intensive mixing and it is difficult to show definitely the part that is attributable to the clay product and the part attributable to intensive mixing. The committee therefore commended for consideration both the question of the clay products or other highly bonded material and the more extensive use of intensive mixing equipment. It pointed out that, with the testing methods now available, molding substitutes should meet with greater success than in the past. The committee believed that had early investigators had the benefit of these tests for permeability, bond, etc., many foundries would be operating with molding sand substitutes and using less new material. The committee outlined the following salient points: Conservation is the first step; proper selection of material to that end; treatment of that material necessary to develop its desirable qualities; intensive mixing and preparation so that each pound of new material may bond the maximum amount of old sand; application of the A. F. A. test as an aid to better molding and control; conservation and reclamation.

The committee announced that in view of the extended use of various sand molding substitutes, it intended to investigate various materials to determine those best suited for the bonding of old sands and that in steel foundry sands it will investigate the application of classification of the various grain constituents.

Discussion

In the discussion Mr. Harrington said that by sand substitutes he meant a substitute for any ingredient contained in molding sand. A. A. Grubb stated that the Ohio Brass Co. has been so successful in sand reclamation in its brass foundry that it had completed a plant for the reclamation of sand in its malleable foundry.

Testing and Grading Sands

The report of the sub-committee on the method of testing foundry sand was presented by the chairman in the absence of Professor Heinrich Ries, Cornell University, chairman of the sub-committee. The report

stated that the committee had taken up the matter of testing sand for cores and for testing the cores themselves, but it was not ready to submit a report on this matter. Apparatus for testing the tensile strength of sand will be the object of a later report. The committee announced that it is working on tests on refractoriness of sands in connection with the U. S. Bureau of Mines in Columbus and with a Canadian committee. A report on this subject is promised for next year.

A report of the sub-committee on grading foundry sand was presented by A. A. Grubb, Ohio Brass Co., Mansfield. This stated that a uniform grading system is desirable as the different methods used have resulted in much confusion. However, the working out of a method must necessarily be a slow process. The committee declared that the value depends on many factors but agreed that fineness of texture should be the first subject considered and that this should be based on the grain alone after the clay is washed out. The next question was to obtain the index figure to determine the texture of the grain. Several methods of determining this were proposed and tried out. At a recent meeting the committee decided to recommend the special A. F. A. fineness factor for use in determining grain texture. This factor will be applied to 700 samples and after the test the committee will examine the data.

A report of the sub-committee on geological survey was submitted by the chairman. This listed certain molding sand resources in Iowa, Kentucky, New Jersey, Pennsylvania and Wisconsin, being supplemental to the report on the same subject submitted a year ago.

Special Papers on Sand

Some examples of "The Relation Between the Formation of Sand Deposits and Their Physical Character" was the subject of a discussion by D. W. Trainer, geological department, Cornell University, Ithaca, N. Y. A paper on testing apparatus by T. S. Adams, Cornell University, was submitted without being read.

A very complete paper covering a survey of molding sand resources in Ohio, prepared by the University of Cincinnati and some of its students, was submitted by P. Willard Crane, representing the University of Cincinnati and the Commercial Club of that city.

A method of treating handling sand at the foundry of Deere & Co., Moline, Ill., was discussed by Max Sklovsky, of that city. He described the method and special apparatus used in handling molding sand in a continuous operation unit. The sand is not hand shoveled at any stage of the production operation. A special revolving sand treating apparatus consisting of a series of revolving shelves, one above the other, is used to cool, aerate and cut the sand so that it passes

through a complete cycle every 30 min. The number of filled molds at any one time is less than 5 per cent of the total daily production. This rapid cycle permits the use of very few flasks and facilitates a quick change from one job to another. Only 14 flasks are used for making 300 molds. Advantages claimed for the system include reduced amount of equipment, economy of space, reduction of labor and increase in production.

Control of Molding Sand

The second sand session which was devoted to sand control was presided over by R. A. Bull, director Electric Steel Founders' Research Group, Chicago.

The first paper, which was on "Molding Sand Control in the Foundry," was prepared by W. H. Dietert and M. W. Myler, engineering department United States Radiator Corporation, Detroit, and was submitted by the former who discussed the subject matter in the paper, which was a description of the method of sand control in the plants of that corporation. He said that there are two ways of handling sand control. One is by having the matter in charge of a technical staff and the other is by having a superintendent with a technical assistant. He favored the latter plan and this is used in his company's six foundries. Each foundry has a sand tester who is able to test all the sand for a 125-ton foundry requiring 150 tests daily. The testing is done at night when the sand crew is cut-

compounding of core sand mixtures, discussing the problem largely from a physical point of view. The primary properties in which the core maker is interested, he said, are the green bond, dry strength and permeability. While these properties are influenced by the kind and quality of binder used, the sand is a very important determining factor. These qualities are not readily obtainable in the same core sand mixture. The proper working properties of core sands can be obtained by the proper blending of sharp sand and bonding sand. Results of tests indicated that there are two general types of core sand mixtures—straight silica mixtures of a low colloid content and molding sand mixtures. Straight silica sands generally require less binder to produce a given strength of core than do molding sand mixtures. The difference in binder requirements is very important because oil binders usually represent one-fourth to one-half of the cost of a core sand mixture. The straight silica sands are less plastic. As a result, over-ramming is less apt to produce tight cores. The straight silica cores can usually be more easily removed from the castings than those from mixtures containing clay. However, there are certain advantages gained by the use of molding sand or small percentages of colloidal clay in core sand mixtures. These mixtures afford the maximum permeability for a given bond. In other words, they are adapted to very open work that cannot be made from

Features of the Week

Notable Interest in Foundry Sand Problems and in Cost Accounting.

Three Sessions on Gray Iron Foundry Practice.

Three Meetings Devoted to Non-Ferrous Topics.

The First Round Table Discussion Held by Foundrymen a Signal Success.

The Third Largest Exhibition Since the War.

Large Display of Molding Machines, Many of Them New.

ting the sand. The tester gets three samples from the heap sand after it is cut and first tests it under a permeability rammer, the sand being tested for moisture, permeability and strength. The results are compiled on a sand control test sheet having columns for recording the finished castings. The sand temper adds water or dry sand if needed as indicated by the test sheet. The use of the permeability and strength reading was described. In tempering new sand one of the plants uses a water meter for measuring the water for each floor. This has proved a very satisfactory method.

Discussion

In the discussion Mr. Harrington said that similar control was in use at his company's plant and they were getting excellent results. In reply to a question Mr. Dietert said the moisture tester is affected by iron in the sand but allowance is made for that. There was some discussion of the testing of sea coal. Mr. Harrington said he had tested this with a combustion furnace but the test had not proved successful. Mr. Grubb pointed out that the checking of new sands was a matter of very live interest. He had found that rain-soaked sand gave different permeability and bonding tests than if not water-soaked so that too great reliance must not be placed on tests.

Core Sand Mixtures

The selection and blending of core sands was discussed by Mr. Grubb. The writer declared there is much to be gained in the way of better castings, lower costs and increased production by the proper selection and blending of core sands and he outlined some of the principles and methods that had aided the Ohio Brass Co. in the selection of sands for core work and in the

sands of a low bond. The author referred to specific cases of considerable saving that resulted in the proper selection and blending of core sand to provide the desired grain and clay content.

Discussion

In a discussion of Mr. Grubb's paper, W. M. Saunders said that trouble had been experienced with dyes used in testing core sand because of different makes of dyes. A joint committee is now trying to secure a standard dye. A dye of full strength was recently introduced by the DuPont people, he said, and it appears to be giving satisfaction.

Testing Core Sand Mixtures

Methods of testing core sand mixtures were discussed in a paper prepared by J. Fletcher Harper and W. W. Stephenson, research department, Allis-Chalmers Mfg. Co., Milwaukee, and presented by Mr. Harper. The authors stated that they have been unable to find a definite record of a standard method of testing core sand mixtures so as to get an unbiased test result from which a fair comparison can be drawn of the different kinds of core sands and binders. They believe there is an opportunity to show a saving in foundry costs if more attention is given to testing these mixtures. Their company has tried to adopt a standard method in experimental testing work. By using the sand testing equipment recommended by the joint committee on molding sand research and with some minor additions, they have made tests for strength and permeability of cores which permit them to make a comparison of different core sand mixtures.

The authors described their method for making a

 Authors of Some of the Non-Ferrous Papers


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SAMUEL DANIELS

ROBERT BLACK

core test piece for the transverse test and the apparatus for testing. The core piece is tested under weight and its breaking strength determined, the value in

pounds being regarded as an excellent test in the comparison of cores. Their method of making the permeability test was also outlined.

Sessions on the Gray Iron Foundry

THREE sessions were devoted to problems of the gray iron foundry, wide scattered over the week. One was held on the first day and reported in part in THE IRON AGE, Oct. 8. The other two were held Wednesday and Friday.

At the second session devoted to the gray iron foundry, three papers were presented, two of which covered highly interesting subjects. A. B. Root, Jr., presided.

Oxygen and Strength of Cast Iron

The old question of the effect of oxygen on the strength of cast iron was revived by a paper entitled "The Oxygen Content of Coke and Charcoal Cast Irons" by James R. Eckman and Louis Jordon, of the Bureau of Standards, Washington, and W. E. Jominy, University of Michigan, Ann Arbor, Mich.

The paper reviewed the hypothesis of the late J. E. Johnson, Jr., that strong irons contain more oxygen than weak irons and that the superior strength is due to the presence of oxygen. Reference is also made to Jominy's comparison of coke and charcoal irons which confirmed Johnson's hypothesis. The authors then review the methods of determining oxygen in cast iron and emphasize the possible errors in oxygen due to the preparation of samples. Reference is made to a new vacuum fusion method of the Bureau of Standards by means of which oxygen is determined in the solid piece of metal. Careful analyses by this new method of twelve charcoal and eight coke irons, whose mechanical properties had previously been reported by Jominy, failed to show that the stronger irons contained more oxygen than the weaker irons. In fact, the rather small differences observed in the result of the oxygen analyses pointed more toward a slightly higher oxygen contained in the weaker irons.

It is claimed by the authors that the vacuum fusion method for determining oxygen is more accurate as applied to cast iron than the methods employed in previous investigations. Determinations of hydrogen, combined nitrogen, graphitic and combined carbon likewise failed to reveal any differences in chemical composition which were characteristic of the charcoal and coke cast irons.

Discussion

Commenting on the Johnson theory, which created some sensation when it was brought out several years ago, Dr. Moldenke said that he was gratified that the

conclusions of the authors did not support the Johnson hypothesis. In his opinion a new beginning can be made in the study of this subject. Other gases may have some effect. Even if it be granted that a harder and stronger iron is obtained, this may be due to the fact that the metal may set too rapidly, or that it may be in an oxydized condition. Much depends upon the method of analysis for oxygen. This gas may occur in iron as oxide of iron or as a gas such as carbon monoxide. It should be possible to distinguish as to which is gaseous oxygen and which is dissolved oxygen.

Nickel and Chromium in Cast Iron

An extensive report covering sixty printed pages on the effect of nickel and chromium in cast iron was the basis of a paper entitled "Nickel and Nickel-Chromium in Cast Iron" by T. H. Wickenden and J. S. Vanick of the research department International Nickel Co., New York. The results, which cover an extensive investigation, give the effects of nickel and chromium additions on the properties of gray iron of principally three different grades carrying 1.40, 2 and 2.70 per cent silicon, together with low sulphur and phosphorous. The nickel content varied from 0.10 to 5 per cent and the chromium from practically nothing up to 0.50 per cent. The authors also give some of the present commercial applications of nickel and chromium-bearing cast iron with suggestions for further development in the use of these two alloys. The effects of these elements upon the carbon and graphite in the iron, upon the chilling qualities, upon the fracture and structure, upon the hardness and machinability, upon the strength and toughness, as well as on the shrinkage, porosity and fluidity are given in detail.

One of the interesting conclusions of this paper is that reduction of chill is one of the most useful functions of nickel in iron. The addition of nickel also increases the hardness, which is of an entirely different nature from that obtained by the addition of chromium. In other words, iron can be hardened with nickel and yet be as readily machined as in the softer condition. Corresponding to the effects of nickel and chromium in refining the grain and in increasing the hardness are similar effects of these alloys in increasing the strength, such as compressive, tensile and transverse, these increases amounting to from 10 to 50

Authors of Some of the Papers



H. F. MOORE



H. L. CAMPBELL



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C. L. LORIG

per cent. Nickel definitely improves the toughness, as measured by various methods. A table is given which presents a list of some of the present typical commercial uses of iron alloyed with nickel and nickel-chromium, among which may be mentioned thin section resistance grids and piston rings, pistons, automobile, cylinders and sleeves, rolls, pipe balls, etc.

Discussion

That nickel softens and strengthens iron and that chromium hardens and toughens it was offered by Dr. Moldenke as his experience based on a long series of experiments with Mayari iron. The fact that this iron contains nickel and chromium in practically fixed amounts as obtained from the ore before it enters the blast furnace, is considered an advantage by him. He described gray iron as steel interspersed with graphite. If the graphite is left unchanged, the adding of alloy improves the product, but if the graphite is changed, the character of the metal is still further altered. These conditions may be brought about by nickel and chromium. So far as cost is concerned, he felt that the use of 2 and 3 per cent of virgin nickel was allowable, but that increasing this to 5 per cent might be extremely expensive. In such alloy castings he rather favored the securing of the nickel and chromium through the blast furnace, but he felt that the future may show that irons containing nickel and chromium originally may have additions of these elements made to advantage. In any event, the paper was one which pointed in the right direction.

In response to a question as to the effect of the high manganese in presence of the nickel, R. S. McPharren, Allis-Chalmers Co., Milwaukee, offered the results of his experience to the effect that such castings were easily machinable. George K. Elliott, metallurgist the Lunkenheimer Co., Cincinnati, said that he had used nickel in iron for fifteen years and that this was the first good paper on the subject. He felt that users of these alloys could study this paper to advantage before making such castings. He pointed to the fact that in brass scrap today there is considerable nickel, and that possibly in the near future cast iron scrap might contain considerable nickel and even chromium. It would, therefore, be well for foundrymen to post themselves on the effects of these elements even in small quantities. This information the paper amply furnishes.

J. E. Fletcher, representative at the convention of the Institute of British Foundrymen, offered some interesting testimony. Recounting some early experience of white iron, he said that he had added nickel until this iron became gray and then had added chromium until it had become white iron again. He considers it rather remarkable that the proportions of nickel and chromium were nearly the same as those used in the

making of armor plate, and also that these proportions were quite similar to those described by the authors. He pointed out that it is the condition of the carbon which must be watched in using nickel and chromium in the iron, and that one must regard nickel-chromium cast irons as steels embrittled with graphite. In his opinion there is a bright future for these alloy irons.

Phosphorus and Total Carbon

An interesting paper on "The Influence of Phosphorus on the Total Carbon Content of Cast Iron" was the subject of a paper by J. T. MacKenzie, metallurgist and chief chemist American Cast Iron Pipe Co., Birmingham, Ala. The work covered by the author was undertaken to ascertain how small an increment of phosphorus would really affect the total carbon enough to count in the ordinary foundry processes and how much would the net effect be on the fluidity and life of the molten iron, and on the strength, deflection and impact resistance of the test bars. Comparisons are often made between northern and southern irons—most frequently based on the superior deflection usually obtained from the former. Almost without exception this is attributed to the higher manganese content of northern irons. The author believed, however, that the influence of the phosphorus on the total carbon was a much more logical explanation, although the manganese also has an influence in the same direction in this case the low manganese and high phosphorus irons from southern ores tending to low carbon, while the high manganese and low phosphorus in northern irons tend to have higher carbon. Inasmuch as carbon is the chief, though unfortunately the most neglected factor in the properties of gray iron, says the author, it is well to examine all the other elements as to their influence on the carbon first, and after that to look for the individual effects. To obtain a comprehensive idea of the author's results, the original paper of twenty-four pages should be consulted.

In a written discussion, J. W. Bolton, metallurgist Niles Tool Works Co., Hamilton, Ohio, discussed in some detail some of the steps in the author's investigation and said that this excellent paper adds much to the knowledge of the effect of phosphorus on cast iron.

Increasing Superheat of Cupola Metal

The relative parts played by oxidation of the metal, the differences between the melting and the freezing range of cast iron and heat absorption by conduction, radiation and convection were discussed in a paper by S. J. Felton, Ohio Mechanics Institute, Cincinnati, the effect of these elements being outlined. This paper, under title of "Superheating Iron in the Cupola" was presented at a session devoted to gray iron foundry practice, at which W. J. Kihn, foundry engineer, Worthington Pump & Machinery Corporation, New York,

Authors of Some of the Papers



J. S. VANICK



O. W. POTTER



S. R. ROBINSON



G. A. DRYSDALE

presided. This was the third gray iron session, held the last day of the convention. Four papers were read at this session, which was well attended. Discussion was active and the meeting extended beyond the closing time.

In discussing some of his theories on the cupola, Mr. Felton stressed particularly the point that the use of moderate excess of coke acts as a desirable safety factor and does not lower tapping temperatures. It was said also that low melting-temperature iron must melt high in the cupola to assure sufficient superheat. The rational method of investigating a cupola heat is to record temperature, volume pressure, oxidation losses, etc., throughout the heat. There is a compensating mechanism which enables satisfactory metal to be produced under a variety of cupola conditions.

It was pointed out that although in most furnaces heat-balance is of primary importance, this is not true in the case of the cupola. In the ultimate analysis of foundry costs, the thermal efficiency of the cupola was said to be a small item compared with its efficiency as a producer of high quality, high temperature metal. It was contended that such results are more readily obtained with inefficient thermal operation, than when operating at the maximum thermal efficiency. The main significance of the cupola heat-balance is the determination of the amount of heat lost from the hearth and bottom, as this is at the direct expense of the temperature of the molten iron.

Methods of increasing superheat were outlined. Low tuyeres and continuous operation combined with intelligent pouring methods, would, it was said, considerably increase pouring temperatures in many foundries. The preheating of the blast should cause higher temperatures in the cupola and result in hotter metal. Retarding radiation from the hearth and bottom by the use of white paint or other means should be beneficial because heat lost from this area is supplied by the molten metal exclusively. It was claimed that the type of wind box which permits the cold blast to circulate the hearth, thus enormously increasing the rate of heat transfer from the molten metal by convection, is detrimental to high tapping temperatures and could be replaced more profitably by some type of bustle pipe. In conclusion it was stated that in the last analysis, the most positive method of increasing and assuring superheat seems to be the duplexing or Elliottizing of cupola iron in the electric furnace.

Size of Tuyeres Not Vital

That there is nothing vital in the size of the tuyeres and that small tuyeres have a marked influence on the melting, conclusions stated in a paper on "Cupola Melting Rate as Effected by Tuyere Ratios" by J. Grennan, foundry instructor, University of Michigan, brought out active discussion.

This paper describes a series of experiments conducted in the foundry at the University of Michigan to see if there was any marked change in results obtained by changing the size of the tuyeres. The cupola used was a No. 3 Whiting, lined to 32 in. A positive pressure blower driven by a variable speed motor was employed, this equipment permitting of varying the size of the tuyeres and still getting the same volume of air in the cupola. There were four tuyeres of the continuous type, each tuyere being $3\frac{1}{4} \times 16\frac{1}{2}$ in., at the inside of the lining. They were equally spaced and had two vanes each to distribute the blast, these vanes cutting each tuyere into three sections. The original tuyere area was 1 to 3.7 cross section of the cupola area. The first reduction brought the ratio to 1 to 6.2; the second, 1 to 12.4; the third, 1 to 25 and the fourth, 1 to 41. The operation of the cupola was described and the results of varying the tuyere ratios shown by means of a chart.

In addition to the conclusions stated above it was claimed that it might be advisable to use large tuyeres (if the cupola is not working very regularly) but within the limits of the sizes in use, no foundryman is justified in changing cupola tuyeres except at such convenient times as when relining the cupola. The difference in pressure due to the smaller tuyeres would increase the power required to drive the motor. It was stated that an ideal set of tuyeres is one in which there is a minimum amount of friction offered to the passages of air into the cupola and one which distributes the air uniformly around the cupola. The continuous tuyere of 1 to 4 ratio was said to satisfy these requirements.

In discussing the paper the importance of the size, shape and location of the tuyeres was stressed as vital by many and a 1 to 4 or 1 to 5 ratio advocated.

Determining Qualities of Core Oils

A study of the properties of 23 commercial core oils with the purpose of establishing some method for determining the relative qualities or values of oil binders for cores, was outlined in a paper on "The Qualities of Commercial Core Oils" by H. L. Campbell, assistant professor of metallurgical engineering, University of Michigan. The investigation is regarded as one of large economic importance.

The chemical and physical properties of these core oils were studied in order to note any relationship between those properties and the bonding qualities. The properties determined were specific gravity, refractive index, iodine number and unsaponifiable matter. Equipment was devised for providing a uniform method of making test cores and a special testing machine was built for measuring accurately the transverse strength. Some of this equipment was shown at the exposition by the University of Michigan core oil investigation.

The characteristics of the core oil binders studied were shown graphically, it being indicated that some oils have a limited temperature range at which high properties are produced. Some oil binders have relatively low strengths at all temperatures. The temperatures at which maximum strength was obtained varies from 400 to 475 deg. Fahr. The bonding properties of some core oils were shown to vary greatly with relatively small changes in baking temperature.

In conclusion it was said that commercial core oils are prepared from so many different drying oils and other materials having various chemical and physical properties, that it is impossible to establish the value of an oil as a core binder on the basis of any chemical or physical property of the oil.

The bonding property of core oils may be determined accurately by making test cores in a uniform manner, baking these cores under definite conditions and measuring the transverse strength of the cores.

The economic use of a specific core oil is possible only when the characteristics of that oil are known and the baking practice is controlled so that the maximum bonding effect of the oil is obtained. This study

is being continued, a number of things having to be settled on before standardizing the methods for testing core binders.

Decrease of Sulphur by Sodium Compounds

The production of softer iron, elimination of hard spots, excessive shrinkage, porosity and sulphuric scab by the use of a sodium compound as a desulphurizer and purifier in the melting of high sulphur iron were discussed in a paper on "Desulphurization of Ferrous Metals," by G. A. Drysdale, metallurgical engineer, Metal Improvement Co., Cleveland. The resulting castings were said to tend to give higher physical properties and lower Brinell hardness. The methods of application, action, and advantages of using the sodium compound as a flux were outlined and a series of experiments described, the data given embracing cupola as well as ladle tests. It was stated that the study of the scientific fluxing of metals may still be regarded as in its infancy and that vast improvements along these lines may be expected during the next few years.

Session on Steel Foundry Practice

ONLY one session was devoted to steel foundry practice, at which the attendance was large. Three papers were scheduled. Two of them were especially interesting. There were also reports of several committees. John Howe Hall, metallurgist Taylor-Wharton Iron & Steel Co., High Bridge, N. J., presided.

Quality Steel from the Converter

The possibilities of the converter in making high-grade steel were forcefully brought out in a paper by R. S. Robinson, metallurgist Industrial Works, Bay

plain carbon steel. The paper gives the physical results obtainable from the alloy steel. An interesting point in the paper is the description of the use of special skim gates, which are said to have eliminated much of the trouble due to dirty castings.

Discussion

Chairman Hall, in opening the discussion, pointed out that this paper afforded a basis for a very good comparison of converter steel with electric and it certainly demonstrated how good converter steel can be made. The question of the use of converter castings unannealed was brought up; Mr. Robinson said that only a few unimportant ones found their way into use without annealing. R. H. West, West Steel Casting Co., Cleveland, in discussing the strains which usually exist in unannealed castings, cited in particular steel wheels for automobile trucks. His company had had trouble in making them stand up under cold and hot climates when unannealed. Proper annealing, however, had eliminated any such trouble.

R. A. Bull, research director Electric Steel Founders Research Group, Chicago, said that he had seen cases of internal strains in castings which had sprung apart without any shock at all, but after heat treatment no such cracking took place. He complimented the author on the very high grade of steel which was described and emphasized the point that it was not always the composition or the process, but correct foundry practice which brought about these results. The good effect of high-manganese was commented upon and Mr. Bull expressed the firm conviction that no limit should be put by specifications on the percentage of manganese in the steel. Another speaker pointed out that it is now possible to regulate the sulphur in the cupola iron by the use of soda ash and that in his plant it had been possible to use as high as 100 per cent scrap with frequent operation using 90 per cent scrap. Sulphur, which used to run as high as 0.09 per cent, had now been decidedly reduced with the disappearance of cracking. He also said that manganese was maintained around 1 per cent.

The chairman said that the whole question was very important, in that attempts were being made in certain specifications to rule out converter steel entirely and that one specification in particular, that of the American Society for Testing Materials and the American Railway Association, was attempting to limit the percentage of manganese to nothing higher than 0.80 per cent in steel castings.

Electric Furnace Steel

The only paper devoted to electric furnace steel was one entitled "Notes on the Operation of a 1½-Ton

J. E. Fletcher was the author of the British exchange paper and the official representative of the Institute of British Foundrymen. He took an active part in discussions



City, Mich., entitled "Carbon Steel and Carbon-Vanadium Steel by the Converter Process." After outlining the specifications to which the carbon steel is made and after describing the equipment, the author discusses some of the points in the melting practice, which accounts for the unusually high physical results given in the paper. Principal among these is the reduction of the total sulphur in the cupola metal by the use of granular soda ash and the maintenance of a fairly high content of manganese in the final product, that is, above 0.75 per cent. He also emphasized the keeping of the carbon content around 0.20 per cent. As a result of these special modifications of ordinary practice, the author states that there has been less trouble with cracking and a decided improvement in the toughness and strength of the steel. Two methods of heat treatment are recommended for this particular grade and the physical properties obtainable are given in the paper. In the case of carbon-vanadium steel the author describes the melting practice as well as the heat treatment, both being quite similar to that outlined for the

New Directors Elected This Year



H. S. SIMPSON



J. L. JONES



FRED ERB

Electric Furnace Producing a Large Tonnage" by A. W. Gregg and N. R. Knox of the Bucyrus Corporation, Milwaukee. It was presented by Mr. Knox. It is devoted almost entirely to a discussion of the performance of an electric furnace which has been pushed for output over a period of one year. Considerable space is devoted to the detailed discussion of factors which enter into the securing of a long life of refractories, and the methods followed in relining sides, bottoms and covers are given in detail. Considerable valuable information is found in the paper covering details of the basic melting practice, which do not usually appear in print. Besides a complete log of an average heat and a discussion of furnace operations, there are tables which give cost data on all items of operation and also results of physical tests of a number of plain carbon and alloy steel heats.

Discussion

That this paper gives valuable information on electric steel furnace practice, supplementing the excellent one by T. S. Quinn at the Milwaukee convention a year ago, was emphasized by Chairman Hall. There was some general discussion as to the ability to regulate the percentage of silicon and manganese in electric furnace practice. Mr. Knox stated that their practice was to put the silicon in the ladle and the manganese in the furnace, and that it was not the intention of the authors to give the impression that they have had much trouble in regulating these percentages. Attention was called to a report, printed by the Electric Steel Founders Research Group, on the control of silicon and manganese in steel as made by the acid electric process in the five plants of that group. Proper control is often due to the man using the process and not to the process.

Major R. A. Bull said that the explanation of successful regulation of these two elements was a standardized method of operating the furnace, but called attention to an article in *THE IRON AGE* of Oct. 1, by John Howe Hall, on "High-Manganese Steel Castings," which he said would offer a reply to some of the ques-

tions which had been raised on the subject of silicon and particularly manganese.

Castings for Navy Use

The third paper, "Making Miscellaneous Steel Casting for Navy Use" by D. F. Ducey, lieutenant commander United States Navy Yard, Puget Sound, Wash., was delivered only by title. It is quite general in character and goes into some detail on the methods and practice followed in a steel foundry which makes repair castings for the navy. The equipment of the foundry is described as well as a special green facing sand and the use of special fillets. A considerable portion is devoted to the details of a system of planning and routing and the forms which are used. There was no discussion of this paper.

Committee Reports

Two committee reports were presented, one by the A. F. A. representative on the joint committee for the Investigation of Phosphorus and Sulphur in Steel, and the other a report of the committee on Specifications of Steel Castings. The former was presented by R. A. Bull.

The other committee report was presented by A. H. Jameson, Deemer Steel Casting Co., New Castle, Del. It dealt with the progress which has been made by subcommittee XXII, by committee A-I of the American Society for Testing Materials in drawing up specifications for carbon steel valve castings for high temperature service. He reported that the result was a compromise and that the final draft of the tentative specifications was approved by committee A-I and presented to the general meeting of the A. S. T. M. last June. Some details of this were given in *THE IRON AGE* of July 2. Because the members of the A. F. A. have not come forward with such suggestions as the committee had hoped for, the report urged that it was highly important that all members interested in this subject should try them out in actual practice so as to be prepared to offer modifications later.

Group-Bonus Wage Plan in Malleable Foundry

WHAT is known as the group bonus plan of wage payments was discussed at a session devoted to the malleable iron foundry. A paper was presented on the subject by B. R. Mayne, plant manager of the malleable iron plant of the Saginaw Products Co., Saginaw, Mich.

The basis for establishing the wage is 1000 lb. of customer's good castings. The plan has been used at the Saginaw plant for about four years. Various changes have occurred and in some cases it was found impractical to carry certain operations on a group

bonus plan, and several objections can still be raised. Necessary to the working of a group bonus plan, the author says, there are a few prime requisites, otherwise, day work proves the most adaptable.

First, the groups must be logically arranged as to operation, which are as nearly repetitive as possible. "The foreman as well as group individuals must be 100 per cent sold on the idea." "It is quite necessary," he adds, "that the groups be given periodic statements as to their status." The plan "has resulted in increased production throughout the plant, decreased work in

Some of the Board of Directors



C. R. MESSINGER



G. H. CLAMER



C. B. CONNELLEY

the payroll department, an accurate check on all men with the resultant opportunity to weed out laggards, assisted the employment department by allowing them to guarantee an applicant for work a fair and just day rate, and has given the company a satisfied working force, thereby reducing labor turnover."

There are 17 groups in operation under the plan. The bonus payment begins when 75 per cent of standard efficiency is reached. An employee receives a guaranteed hourly rate, which is set at a fair point for the community and for the class of work that is being done.

Discussion

The discussion developed a varied experience in bonus wage payments and a variety of methods. The Union Malleable Iron Co., East Moline, Ill., has a plan in operation about a month under which a certain bonus is paid when the amount of scrap does not exceed five per cent, with increases until with no scrap the bonus is substantial. So far the plan has stimulated attendance, production and the reduction of scrap, and so far is altogether favorable.

The Ohio Brass Co. has its men in groups, each under an instructor, who gets a bonus in addition to his salary. A checking system traces losses to the molder and it is the instructor's job to prevent repetitions through imparting information. The scrap matter is primarily the tool through which he works to save losses and earn his bonus. The experience is that the success achieved is due probably as much to the

recording of the performance as to the bonus itself. By posting results on charts competition between the groups is brought about and an important point is that the results are posted on the day following that on which the work was done. The men quickly learn when there is something wrong, as a scrap percentage over five, for example, appears in red.

The view was expressed in the course of the discussion that the payment of a fair wage secured satisfactory production without a bonus and that faults resulting in scrap sometimes were those beyond the control of the molder and should be taken into account in the applying of a bonus. The answer given to this contention was that the main thing is to focus on losses quickly and have the inducement to ascertain the causes.

A bonus system somewhat like that in the Saginaw plant has been introduced into the chipping department of the Whiting Corporation. One net result is that seven men are now doing the work of eleven. In concluding the discussion, Prof. Enrique Touceda, chairman of the session, suggested that the question should be made the subject of a symposium at next year's meeting.

Prof. Anson Hayes, Iowa State College, Ames, Iowa, presented three separate papers at the malleable session, representing research work on rates and conditions of graphitization of white cast iron conducted jointly by him and others. The experimenting has not been completed and further findings, it was intimated, are likely.

Foundry Cost Accounting

TUESDAY afternoon's session on the distribution and handling costs, under the chairmanship of A. E. Hageboeck, Frank Foundries Corporation, Moline, Ill., and chairman of the American Foundrymen's Association committee on costs, brought out unusually large attendance (estimated at 350) and an exceptional amount of spirited discussion. Mr. Hageboeck told of the aims and purposes of the cost committee, setting down four fundamental factors as follows:

- 1.—Actual costs are unknown in altogether too many cases.
- 2.—Castings must be sold on the basis of the cost of production.
- 3.—Correct cost finding methods are therefore essential.

- 4.—Uniform methods of cost accounting are highly desirable.

Six bids on a 4½-lb. casting of a hardware specialty, in lots of 100, were spread from 5c. to 12c. by the six different foundries. Lack of adequate cost accounting methods was responsible for this condition. Similarly, six bids on a steel casting varied from 9c. to 15c. per lb. Four of these, however, give evidence of real cost accounting systems, for they were respectively 12c., 12c., 12.4c. and 12.5c. In another case a jobbing casting weighing 750 lb., and asked for as a single casting or as ten from the same pattern, varied from 3¼c. to 10c. per lb. Some of the bidders showed a variation of only ¼c. between one casting and ten castings. An automobile transmission case, asked for in lots of 5000, varied from \$4.50 to \$6.50 each.

Foundry Management and Its Effect on Costs

Under the above title W. J. Barrett, one of the investigators of the Metropolitan Life Insurance Co., New York, who studied 54 foundries all over the United States and many of the results of whose studies have been published in a number of articles in *THE IRON AGE* during the past year, spoke on the above topic. He pointed out particularly the importance of up-to-date methods of handling materials, calling attention to the fact that in some cases it is found necessary to handle 168 tons of materials for each ton of salable castings produced. His studies had shown him that, in general, iron and steel foundries differ largely in their methods of material handling.

An example he gave of two Ohio foundries showed A using seven men working their hardest to load the cupola. Wheelbarrows were used for iron, scrap and coke over a 200-ft. dirt runway. The material was put on the scales and then handled separately into the cupola. In contrast B foundry, handling three times as much metal, did the job with only three men. This company used a concrete runway, made up a unit charge in the yard, transported it on an electric truck to the cupola, used tipples for coke and had its skids high enough so that charging the iron into the cupola required little lifting.

He pointed out, on the other hand, that the purchase of new equipment must be made with full recognition of limitations of the shop buying it. Two foundry managers, one running a production foundry and the other a jobbing foundry, saw a new machine demonstrated. The production man, after thorough analysis of his conditions, bought the machine and cut his cost of doing a particular job by 50 per cent. The jobbing man bought three of the machines without analyzing his situation and found that, in using them, he could not save any money, as they were in the way and required more labor than he had been using before. An adequate analysis by a proper cost system would have prevented his buying these machines.

Two methods used by the Metropolitan company, in evaluating foundry management are, respectively, the number of deaths among their workers and the number of foundries going out of business. As a general rule, it has been found that the deaths among the iron foundries exceed the estimated number; on the contrary, the deaths among steel foundry workers are considerably below the estimated number. Both estimates were made on the same basis, in connection with the application of group insurance. It would appear, therefore, that management in steel foundries averages far better than in iron foundries.

An example was given of two foundries in the same town in Pennsylvania, both making gray iron castings and between them employing about 200 men. One foundry made castings of from 25 to 50 lb. individual weight, worked for 20 different firms and did all the gray iron casting work for those firms. Its records were simple, but they gave the complete story of the daily work in each department, both as to output and as to cost. The firm made good profits year in and year out, regardless of depressed business conditions.

In contrast the other foundry, which was run by a man stated by Mr. Barrett to be as good a foundryman as any he had ever met, was operated without a cost system. The foundryman claimed he could not afford to hire a lot of clerks. The sequel to the story lies in the fact that recently the first foundry took over the second from its creditors.

An example of sharp practice was given. One foundry using accurate cost data bid 10¼c. per lb. on some castings. This was considered a very fair price for them and, when the contract went to another foundry, the sales manager investigated to learn why. The other foundry had bid 6¼c. The purchasing agent knew that it had no adequate cost system. He told the bidder that his price was too high and succeeded in getting it reduced to 6c., on which price the business was taken. The speaker stated that he blamed the purchasing agent in this instance more than the foundryman who took the business at a loss, because that purchasing agent was keenly aware of the situation and of the fair value of the castings, whereas the other man was not.

Foundry Refractories

AN open forum was held on the subject of foundry refractories, with subdivisions into steel foundry, malleable iron foundry and cast iron foundry practice. There was no paper, but a list of questions was presented. These questions were taken up in order, each being discussed before passing to the next one. Under steel foundry refractories were seven questions relating to rate of speed on heating up a furnace as affecting the life of refractories, methods to prevent excessive spalling of the brick, requirements for good bonding material, uniformity of brick size, standardization, etc.

Under malleable iron foundry refractories 20 questions were considered, covering the character of fuel as affecting side walls and roof, pre-heating the blast, brick bottoms, soft or hard bricks, bungs laid up with mortar or without, thin or thick joints, most economical sizes of brick, insulation of air furnace walls, bottoms

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L. W. OLSON



V. E. MINICH



A. E. HAGEBOECK

and bungs to reduce radiation losses, refractories of higher melting point, elements most destructive to refractories (the chemical action at the slag line was voted the guilty party here), causes of spalling, use of bauxite brick or super-refractories and use of carborundum in daubing mixtures.

Under cast iron foundry refractories the questions discussed were cupola bottoms, monolithic cupola linings, cheap methods of repairing linings operating continuously, and other details of repairing costs and frequency, together with the alternating use of two cupolas, either on alternate days or half a day each.

This turned out to be an experience meeting. There was no clean-cut decision on many of the questions. Conditions vary so widely in different foundries, and more particularly in different kinds of foundries, that a general or uniform answer to most of the questions was impossible. In some cases the answers which were given showed almost diametrically opposite views of results as determined in operation.

Session on Apprentice Training

AN organized publicity program for accelerating the influx of college men into the foundry industry was suggested by R. R. Meigs, General Electric Co., Lynn, Mass., in a paper on "What the Foundry Offers a Technical Graduate as Viewed by a Graduate Apprentice," at a session devoted to apprentice training. The majority of the average graduating class needs to be told what an interesting place an up-to-date progressive foundry can be.

Attracting College Men to the Foundry

In discussing the entry of technical graduates into a foundry organization, it was said that during the training period it was advisable that a definite schedule be drawn up outlining the student's progress through various departments of the shop. The only worthwhile way for a foundry student to break into the work before him is to start as a helper of some sort. The first problem is to get into personal contact with the particular group of workmen with whom he is to work. Not until sound personal contact is made can the student hope to obtain any amount of real first-hand information.

While a student is serving his time on the floor there are times when the novelty of the situation wears away. The biggest stay on such occasions is an interested member of the management who keeps in more or less direct touch with the student. A conversation relating to shop problems or proposed improvements will give the beginner something to think about, providing an outlet for any ideas or information he may have acquired and also give him an opportunity to straighten out possible misinformation.

Of the three classes of foundries, those which are wholly modernized, those which are backward in accepting the results of recent industrial progress, and those which are in the process of improving, the latter was said to provide the best facilities as a training place for prospective foundrymen. In these foundries old rigging and methods are being replaced gradually by new equipment and improved methods. In this type of shop there is enough of the earlier day practices discernible to enable the student to visualize somewhat the conditions existing in those days. Visits to outside foundries are also valuable for the student in obtaining a general conception of the industry.

What may be expected to result from the training course was outlined briefly. The foundry industry was said to be in a stage of constant development, the progress consisting largely in the evolution of mechanical equivalents for manual labor, the elimination of waste and the improvement of the final product. Such a development creates a proportional need for technical knowledge and should increase automatically the foundry demand for technically trained young men.

The meeting was under the chairmanship of Dr. C. B. Connelley, director of industrial relations, Carnegie Institute of Technology, Pittsburgh. Paul R. Ramp, superintendent of the Newport News Shipbuild-

ing & Dry Dock Co., Newport News, Va., outlined briefly the method followed by his company in training apprentices. L. A. Hartley, educational director, National Founders' Association, Chicago, and Mr. Johnson, Wentworth Institute, Boston, were among others discussing apprentice training. Attracting desirable material for foundry apprenticeship courses was among the phases of the subject discussed.

The Obermayer Prize

THIS year the S. Obermayer prize was awarded to the two authors of a paper presented at the first gray iron session, Monday, Oct. 5. (See THE IRON AGE, Oct. 8, page 979). The prize is bestowed annually on the foundryman who originates the most novel and useful device for use in foundry operations as judged by a special committee. H. W. Dietert and W. M. Myler, Jr., engineering department United States Radiator Corporation, Detroit, described in their paper, entitled "Continuous Iron Temperature Recording," a special device which indicates by means of a scale and pointer the temperature of molten iron at any period of the melt. It also makes a continuous record, on a chart,



of the temperature throughout the heat. A study of the chart enables the foundryman to give specific instructions to the cupola tender so as to produce iron within a definite temperature range. He knows that the results of his efforts are recorded so as to be observed by the manager.

The device, as illustrated, is a bare thermocouple shielded from air currents at a fixed distance above the iron stream in the spout. The results obtained are reported as proving conclusively that the foundryman is capable of judging whether or not the iron is in a satisfactory pouring condition for a given class of work.

Proposed Changes in Membership Dues and Initiation Fees

CHANGES in the by-laws affecting the classification of membership, and also dues and initiation fees, were presented by the board of directors at the business session of the association. The meeting voted

submitting them in the regular way to the membership for letter ballot.

It was explained that the changes look toward a classifying of the groups of persons eligible to membership. As it is now, a corporation, partnership, society, or a subsidiary or branch organization may be a member, but it is contemplated that membership shall apply to not more than one branch of such a group. Initiation fees for active membership will remain at \$10, but this will be waived in the case of an individual identified with a group that has membership. Also, it will be waived in the case of an individual following an educational pursuit not of a commercial character. The plan is to encourage more men in relatively subordinate positions in a company to establish active connection with the association as against the present tendency to leave active membership in the hands of those holding the highest executive positions.

The dues for active membership in the United States and Canada remain at \$12, but dues will be charged for the individual members of the organization of a company member at the rate of \$7.50 per annum. Also the dues for persons in educational pursuits will be \$7.50.

A junior grade of membership is also to be established without entrance fee but with annual dues of \$5, to encourage a class which may thus get the literature of the association. The junior, under the proposed by-law, becomes automatically an active member at the age of 25 years.

Honorary membership was conferred on L. W. Olson, retiring president.

Favorable consideration was given by the meeting to the recommendation to accept as the international test bar for gray iron castings bars 1½ in. in diameter with 18 in. distance between supports. By express stipulation the adoption by the association of this international test bar is not to be regarded as prejudicial to the use of the test bars favored in England or to the corresponding test bar regulations in France.

A special tribute was paid to the memory of A. O. Backert, so many years a conspicuous leader in the association, by the meeting's standing in silence for several moments.

One resolution adopted urged the establishment broadly of apprenticeship schools after the fashion of those operating at Milwaukee.

Officers were elected as noted elsewhere, and the presentation of the Obermayer prize by Benjamin D. Fuller to H. W. Dietert and W. M. Myler, Jr., also referred to elsewhere, were among the items of the business session.

The Banquet

The annual banquet, which was well attended, was held Thursday evening, Oct. 8, in the ballroom of the Hotel Syracuse. L. W. Olson, president of the association, presided. The presentation of the Joseph S. Seaman gold medal to Dr. Richard Moldenke, and of the William H. McFadden gold medal to Dr. Robert J. Anderson, was a feature of the evening. Benjamin D. Fuller, vice-president Defiance Paper Co., Niagara Falls, N. Y., made the presentation speech for the Seaman medal, and G. H. Clamer, vice-president and general manager Ajax Metal Co., Philadelphia, that for the McFadden medal. Responses were made by both Dr. Moldenke and Dr. Anderson. The preliminary details of the conferring of these medals and a sketch of the careers of the two recipients were published in *THE IRON AGE* Sept. 17. The toastmaster of the evening was William H. Barr, president National Founders' Association, who after an introductory speech called on the speaker of the evening, James A. Emery, general counsel National Founders' Association, Washington, who delivered a most effective address on "Industrial Progress." The dinner was followed by a reception and dance given by the Syracuse local committee.

The Next Convention

Arrangements have been completed for holding the 1926 convention and exhibition in Detroit the week of Sept. 27. It is planned to make it international in character. It is expected that some of the foundrymen's societies of Europe will actively participate and that the convention will partake of the character of the one held in France in 1923.

Exhibition One of the Largest Since the War

ONLY two post-war foundry exhibitions were larger than the one this year, those in Philadelphia and Columbus in 1919 and 1920 respectively. The main portion was housed in the Manufacturers' and Liberal Arts Building, when more power was in demand than at any previous display. The total space taken in the three buildings used was 57,000 sq. ft. This compares with 55,250 sq. ft. covered at the Milwaukee Auditorium last fall. As is usual, the foundry equipment companies had impressive displays, made more effective by the lack of limitations on height and by the possibility of putting in ample foundations. A feature was the display of new molding equipment.

Only a brief running account of the exhibition as a whole with emphasis on a few of the features is attempted this year in the following:

IN molding machines, one exhibit that attracted attention was that of the Foundries Service Corporation, 25 Broadway, New York, which demonstrated the Wood process of sand molding. These units combine jolt, squeeze, roll over, pattern draw, mold assembly and strip flask operations in one machine, a unique feature being that the flask is attached permanently to the machine and is the only flask used in the molding operation. These flasks are available in several standard sizes to accommodate patterns of various dimensions, the pattern plates being made to fit their respective flasks.

In the Wood process the mold is made and finished complete on the machine, including the setting of cores, if any. When a group of molds is ready for pouring, pouring jackets of patented design are slipped over the molds to support and confine the sand. These jackets are of grill or lattice construction and are machined on the inside to the same dimensions and

taper as the flask, so that they fit exactly over the mold. When placed in position the jackets are secured to the bottom board by hinged clamps which by a simple lever motion hold the mold rigidly to the bottom board. It is only necessary to carry a sufficient number of these jackets for one "round" of metal, as after pouring they may be moved in rotation to the next group of molds to be poured, the transfer being quickly accomplished. An advantage claimed for the pouring jackets is that they obviate the use of separate weights, clamps and wedges, and being of grill or lattice construction, they permit the ready escape of gases on the sides and ends, as well as the top, of the mold, while the continuous band at the joint of the cope and drag is intended to prevent any run-out at that point.

One of the principal savings claimed for the Wood process is the elimination of all flasks in molding except the one attached to the machine. This is stressed as permitting considerable reduction in the usual

investment in flask equipment, and also as resulting in marked economies due to the reduction or elimination of flask storage space, flask repair shop, maintenance and replacement expense.

As to production, it is claimed that with the Wood process molding machines a mold can be completed and placed on the floor in one-half of the time required by other methods, resulting in a saving of 50 per cent in labor cost. It is also claimed that casting losses are reduced to a minimum, the machines being designed so



that the various operations are accomplished with precision, including the assembly of the cope with the drag, which come together in exact register, eliminating danger of casting losses due to shifts.

The machines are available in several types, hand and power operated, stationary and portable, with capacities from the small snap class of work up to the limit of economical production with the use of pattern plates, or as stated by the manufacturer, machines will be available for work in size from small buckles up to bath tubs. They are covered by United States and foreign patents, owned and controlled by the Foundries Service Corporation. The aluminum pattern plates, pattern parts, flasks and pouring jackets used are made by the Columbian Bronze Corporation, Freeport, N. Y., and the molding machines are manufactured by the Bethlehem Shipbuilding Corporation at its Moore plant, Elizabethport, N. J. An illustrated description of the Wood process of sand molding, the machine and equipment used, will be given in a forthcoming issue of *THE IRON AGE*.

Another molding machine that was a center of interest was a high-speed unit for production work, recently developed by the Stoney Foundry Engineering & Equipment Co., Cleveland. This machine employs the vibrating instead of jolt method and is arranged for stripping the mold. Simplicity of construction, resulting in low maintenance cost is a feature, unusual uniformity of ram being also claimed. Molds are rammed in $1\frac{1}{2}$ sec. The company's core knockout machine, which is an application of its vibrator for removing dry sand cores from cylinders and similar castings, was also shown, one unit of this type freeing cores for a 210-lb. cylinder with crankcase en bloc in 10 sec. Shake out bales were exhibited and also the company's new springless vibrator, a feature of which is that it starts in any position.

A new post squeezer, equipped with overhead cylinder, keeping all moving parts out of the sand, was one of 10 machines demonstrated by the Tabor Mfg. Co., Philadelphia. In this machine the head swings

horizontally on the post, and the valve control lever serves as a handle for swinging the head. Rapid operation is a feature. The machine has a 10-in. cylinder and is available in both stationary and portable types. A redesigned jar roll-over machine, the feature of which is that the roll-over and pattern draw is accomplished by compressed air admitted on top of oil, giving close control of the load at all times, was also in operation.

The Osborn Mfg. Co., Cleveland, exhibited a new jolt roll-over squeeze pattern draw molding machine, which operates entirely by air, eliminating hand ramming. This machine, designated as the No. 322, draws the pattern automatically on the down stroke from the squeeze and deposits the mold on a roller conveyor. The heaviest equipment handled by the operator is the empty flask. The machine is made to handle any weight up to 2000 lb. An improved model of the No. 275 jolt squeezer machine was also in operation, the chief improvement being in the head, which operates more easily and is supported entirely from the rear, the supporting members on the sides having been eliminated. Improvements have also been made in the No. 549 jolt stripper machine which now has an open-ended lifting frame to adapt it to a larger range of work. Four other machines were also shown.

One of the largest exhibits of molding machines was that of the William H. Nicholls Co., Inc., Brooklyn, N. Y., which showed 15 machines. A jolt, squeeze and draw machine in operation making radiator loop molds attracted attention. The machine was equipped with an automatic roll-off table and roll-over device, as well as an overhead sand filling device which was fed directly from a combination muller and aerator, the sand being carried up by a bucket elevator. The muller, of new design, was a feature. It has two corrugated steel rolls designed so that there are different surface speeds at each point of contact with the bottom of the pan. Two cross arms, carrying paddles, serve to further mix the sand. Centrifugal force feeds the sand through a gate where it is aerated into a fine mist by means of brushes which throw it also into the buckets of the sand elevating system. The process is continuous. The muller may be set on or below the floor; it occupies a floor space of less than 8 sq. ft. The company's new type 10-F portable combination jolt and power squeezer, with a 10-in. squeeze piston and 4-in. jolt piston was also demonstrated.

Two Sandslingers, portable and tractor types, respectively, were demonstrated by the Beardsley & Piper Co., Chicago.

Among the machines exhibited by Henry E. Pridmore, Chicago, was a new 14-in. combination jolt, squeezer and power stripping plate unit, in which the jolt, squeezer, etc., are separate and can be used independently. There are three control valves, one for each unit. Only one draw cylinder is provided for stripping. A combination air jolt, power rock-over foot-draw machine was also demonstrated, as well as a new core machine with a 12 x 14 in. capacity.

New equipment shown by the Adams Co., Dubuque, Iowa, included a 10-32-in. jolt squeezer, intended for production of light work, taking the place of a hand squeezer. It is available in portable and stationary types and with lift table.

The Milwaukee Foundry Equipment Co., Milwaukee, exhibited its own machines and some manufactured by the Davenport Machine & Foundry Co., Davenport, Iowa, the Milwaukee company having recently taken over the sale of the Davenport machines. Included in equipment demonstrated was a No. 22 Davenport jolt, roll-over, draw machine, which molds up to 12,000 lb. in weight, and 17½ in. in length. A positive leveling device which can be adjusted quickly for various flask heights is a feature. The machine is provided with oil draw.

Six machines, including a 1000-lb. production type jar independent roll-over and pattern drawing machine, were exhibited by the Herman Pneumatic Machine Co., Pittsburgh, and five machines of various types by the Johnston & Jennings Co., Cleveland.

The Grimes Molding Machine Co., Detroit, had a portable jolt-stripping, plate-molding machine in ope-

ration. A portable Rapid plain squeezer and a Rapid jolt squeezer were demonstrated by the Federal Malleable Co., West Allis, Wis. More than 10 machines of a variety of types were exhibited by the International Molding Machine Co., Chicago, a jolt-squeezer machine being a center of interest.

In addition to other foundry equipment, molding machines were displayed by the Arcade Mfg. Co., Freeport, Ill. This company's Modern jolt molding machine has been strengthened and made more accurate, and its jolt stripper has been changed from single to two draw cylinders, which simplifies the construction.

New Sand Preparing Equipment

In sand preparing equipment, the National Engineering Co., Chicago, demonstrated a complete unit consisting of a Newaygo loading device, which aerates and screens the sand and drops it into a measuring hopper over a No. 2 Simpson mixer. After being blended and tempered the sand is elevated to a second aerator, again aerated and discharged into a hopper over the molding machine or on a belt.

A new sand separator and blender was shown by the Royer Foundry & Machine Co., Wilkes-Barre, Pa. This machine is equipped with a skip-hoist self-loading device, the operator riding on the platform of the machine. The capacity is 1,000 lb. per min.

The exhibit of C. O. Bartlett & Snow Co., Cleveland, included one new product, a mechanical vibrator for foundry sand. The outstanding feature of this vibrator is that there is a minimum vibration on the frame and a maximum vibration on the cloth. An unique mechanism has been devised for driving the vibrator.

Large Display of Sand Blast Machines

Sand blasting equipment formed an impressive part of the exposition. In addition to sand cutting machines and other equipment, the American Foundry Equipment Co., Inc., New York, demonstrated a model of its down draft sand blast room, one feature of which is the pressure tank, the filling valve of which has only one moving part, a mushroom plug inside the tank. The separation of dust and abrasive was shown through cut out windows.

The Pangborn Corporation, Hagerstown, Md., exhibited a 10 by 12½ ft., down draft, "clear vision" sand blast room with dust arrester, and exhauster units mounted overhead. The complete equipment was about 10 ft. long, 19 ft. wide and 20 ft. high. Fresh air is taken through inverted louvers in the ceiling, and dust laden air is drawn off through wall ducts near the floor, the movement of dust being away from the operating position. The room is lighted and all operating controls are inside. A rotating table is placed at one side for small work, and the room is provided with double doors and car tracks. Locating the arrester above the room and inside of the foundry building, discharging the clean air into the shop, is claimed to save fuel in cold weather. Reclamation of abrasive is a feature.

A new unit shown by the Pangborn Corporation was the Loads Quick sand blast barrel with direct motor drive. The quick loading device is a feature, it being claimed that the barrel can be loaded, started, stopped and unloaded in five minutes.

A large exhibit was that of the W. W. Sly Mfg. Co., Cleveland, which demonstrated twelve separate units. Among new products shown were pneumatic sand reclaiming equipment for removing dust and other refuse from used silica molding sand, and a continuous tumbling mill with star conveyor, for tumbling simple castings, sprues, forgings, etc. It may be used also for sand crushing and screening. The process is continuous, stars and work being fed in at one end, traversed automatically and discharged at the opposite end. The stars are discharged onto a conveyor and returned to the inlet end of the machine.

The J. W. Paxson Co., Philadelphia, demonstrated, among other equipment, a new siphon feed, small sand blast barrel for brass foundries. This is a combination unit consisting of a small barrel, cabinet, dust collector and fan. It occupies floor space of 5 by 6 ft. Alemite lubrication is a feature.

Sand blast equipment was among the exhibits of

the Mac Leod Co., Cincinnati, and the New Haven Sand Blast Co., New Haven, had its 48-in. self-contained direct-pressure barrel in operation. A model of a new bag type dust collector was also on view. The Ruemelin Mfg. Co., Minneapolis, was also represented.

Materials Handling Equipment and Pneumatic Tools

More than fifteen companies exhibited materials handling equipment and there were elaborate exhibits of pneumatic tools, including air compressing and blowing machinery. A variety of machine tools, including grinders and sawing machines, were demonstrated under power, and there were exhibits of welding and cutting equipment. Pattern shop equipment was on view, one company having fifteen machines in operation. Pyrometers were exhibited and also Brinell hardness testing machines. There were attractive displays of ball and roller bearings, and other transmission equipment.

Several companies demonstrated core making machinery. Makers of core oils and binders were well represented, and there were large exhibits of foundry supplies, including graphite, plumbago and graphite crucibles. Suppliers of pig iron, coke, metals and alloys and abrasives were well represented.

Furnaces for Melting

The outstanding feature of the exhibit of furnaces was an electric furnace in operation for melting gray iron. At previous foundry shows furnaces have been exhibited melting non-ferrous metal but this was the first time that an electric furnace has been in operation at any exhibition melting gray iron. The iron was melted in a Moore Lectromelt furnace exhibited by the Pittsburgh Electric Furnace Co. This was equipped with an automatic high-speed regulator. The castings produced were made for the Straight Line Engine Co., Syracuse. William Swindell & Brothers, Pittsburgh, exhibited a 1000-lb. electric melting furnace and the Detroit Electric Furnace Co., a 350-lb. tilting type non-ferrous melting furnace. The Ajax Metal Co., Philadelphia, also exhibited electric furnaces.

There was also a number of exhibits of oil and gas-fired furnaces for melting non-ferrous metals. The Campbell-Hausfeld Co., Harrison, Ohio, exhibited in connection with its melting furnaces a new strainer for straining the oil before it reaches the burners. The oil goes through a circular strainer from the outside, a plunger cleans the strainer without interrupting the flow of oil so that it can be cleaned when the furnace is in operation.

Miscellaneous Exhibits

Among the miscellaneous exhibits were several representing activities of the foundrymen.

Prominent among these was a display of photographs of the various devices which had been submitted for the 1925 Obermayer prize. There were five of these. Besides the device which was awarded the prize, as described on other pages, there was a revolving reservoir spout submitted by D. McDaniel, Hamilton Foundry & Machine Co., Hamilton, Ohio; third, a skim gate pouring basin offered by J. H. Crawley, foundry superintendent, Industrial Works, Bay City, Mich.; fourth, a core support submitted by John Bibby, Augustine Foundry, Ltd., Kitchener, Ont., and fifth, a strainer core box by Gottfried Olson, superintendent of foundries, Illinois Malleable Iron Co., Chicago.

In another booth the A. F. A. cost committee, by means of placards and actual castings, called attention to some of the variations in quotations of a number of foundries bidding on such work. Besides this they had an iron casting, the weight of which was submitted to a guessing contest with prize of \$50 for the most accurate guess. The awards were made Thursday afternoon at three o'clock. The actual weight of the casting was 109 lb. There were three guesses of 109½ lb., and among these the prize money was equally divided. They were A. C. Porter, Lincoln Foundry Co., Lincoln, Neb.; J. C. Steinfurth, Cascade Foundry Co., Erie, Pa., and D. S. M. Dannel, Deere & Co., Moline, Ill.

Steel Production and Consumption More Nearly in Balance; Prices Should Be Firm

Gain in September Less Than Usual for That Month; Rise in Unfilled Orders Helps to Restore Market Equilibrium

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

CERTAIN facts about the steel situation in September are clear and warrant definite conclusions.

1. The trend of ingot production declined toward the normal level. This means that in recognition of the fact that production has been above normal, expansion of output has been checked.

2. The unfilled orders of the Steel Corporation increased slightly, rising a little nearer to normal. This means that although the volume of orders on hand is below normal, the moderate improvement in the general industrial situation has caused buying to rise a little above shipments. Although no one can say whether or not it is more than temporary, there has recently been more interest in forward buying and talk of "first quarter inquiries" has appeared in a way that is slightly reminiscent of times before the summer of 1925.

3. The average price of finished steel for September was lower than in August by 0.8 per cent, showing that in spite of business improvement the combination of above-normal production and the sub-normal unfilled orders has had its way—the more so because of present competitive conditions in the industry.

As long as the volume of unfilled orders is so low as at present and production continues above normal, the price of steel can be expected to do little better than hold at about present levels. This condition is not likely to change soon, as steel manufacturers are increasing their output of pig iron and steel. On Oct. 1 the estimated daily capacity of active blast furnaces was 4 per cent greater than on Sept. 1, and the gain in steel company output seems sufficient to care for the moderate increase in bookings which is reported, notably in the Middle West.

The logical balance of the present demand and sup-

ply situation would appear to be found in merely stable prices for finished steel.

May Check Pig Iron Advance

THE pig iron situation differs materially from that of steel. The production of pig iron is slightly under normal, and average prices have been advancing. As shown in Fig. 2, this relatively strong position continued through September.

The total September production of pig iron was 21,722 tons greater than the August output and the average daily production showed an increase of 4 per cent. When allowance is made for the normal increase and for the usual seasonal gain, however, the true trend of pig iron production remained practically unchanged. The adjusted index registered 99.4 per cent of normal against 99.6 in August.

Thus there is no overproduction of pig iron. In fact, the production of pig iron is still relatively small compared with the output of steel, a condition which usually means a firm market for the former product. At present the accumulation of scrap and the weakness of scrap prices, however, is an offsetting factor.

Stocks of pig iron at merchant furnaces are believed to be little if any above normal.

The average price of pig iron in September was higher than in August and at the end of the first week in October the upward trend was still in evidence.

As to the future, the balance of probability appears to be against much further rise in the price of pig iron. The production and stocks of iron seem adequate; foreign iron importations continue to affect the domestic market; the average price of steel products is barely steady (though some manufacturers of sheets and of hot rolled strip are advancing quotations); and steel scrap is fairly weak. Some deferred buying doubtless

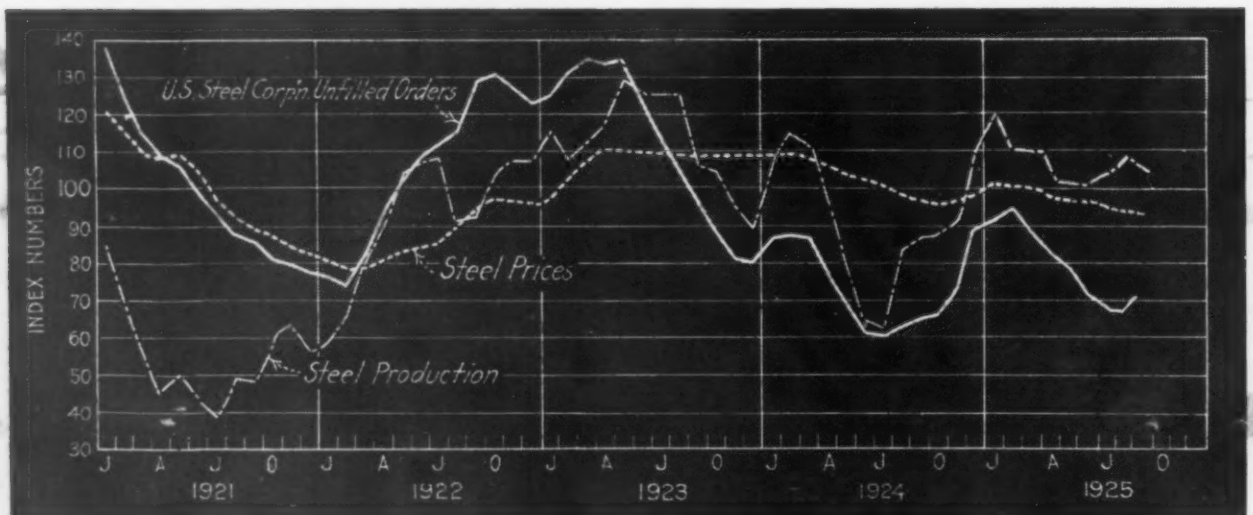


Fig. 1—The Trend of Steel Ingot Production Turned Downward in September, Since the Gain in That Month Was Less Than Usual

In This Issue

September steel output 2 per cent gain over August. (2648 tons per day more).—Plants operated at about 77 per cent theoretical capacity.—Page 1059.

Steel production and consumption more nearly in balance.—Seasonal gain in September less than usual; rise in unfilled orders helps to hold prices firm.—Page 1048.

Corporation's unfilled orders increase 204,494 tons.—First gain since February brings total to 3,717,297 tons.—Page 1057.

Character of current steel output indicates much commercial activity.—The less steel going into railroad consumption, the more into other things, the greater the industrial activity indicated by steel tonnage, broadly speaking; railroad buying relatively small now.—Page 1052.

Production of American pig iron per man since 1900 has increased from 267 to 702 tons.—Better machinery and equipment responsible: America's exports of machinery will do for rest of world what industrial ingenuity has done for us.—Page 1024.

Some foundries have operated three months to year without adding new sand.—Methods of sand conservation and preparation discussed at Syracuse convention.—Page 1034.

New 40-in. blooming mill has largest single-unit reversing motor built to date.—7000-hp. motor drives mill at Wisconsin Steel Works, South Chicago.—Page 1019.

High speed in wire drawing does not of itself increase output per man.—Continuous (including "double-deck") drawing most effective method for increasing productivity and decreasing investment.—Page 1028.

Will proper use of artificial abrasives reduce danger of lung trouble in case of workers habitually using grinding wheels?—Research results indicate such a possibility.—Page 1029.

No evidence that strong cast irons contain more oxygen than weak irons.—Theory of late J. E. Johnson, Jr., not borne out by exhaustive tests: new start can now be made on subject of gaseous content, says Dr. Moldenke.—Page 1037.

Unique method of casting composition metal around monel metal for emergency.—Battleship turbine buckets remade in unusual way to meet time schedule.—Page 1026.

Nickel softens and strengthens iron: chromium hardens and toughens it.—Says Dr. Moldenke, basing contention on long experiments with Mayari iron.—Page 1038.

Ratio of tuyere area to cupola area should be about 1 to 4 or 1 to 5.—Though there is nothing vital in size of tuyeres, says J. Grennan.—Page 1039.

Use of sodium compound as desulphurizer in melting high sulphur iron recommended.—Resulting castings give higher physical test and lower Brinell hardness.—Page 1040.

Group bonus payment plan based on production of 1000 lb. good castings.—Bonus begins when 75 per cent of standard efficiency is reached: has decreased turnover and raised man-hour output.—Page 1041.

Manufacture of steel castings by converter process aided by reducing sulphur content with granular soda ash.—Converter castings require maintenance of fairly high manganese content, e.g., 0.75 percent.—Page 1040.

The Iron Age, October 15, 1925

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Fair Words from Our Friends

"That one article was worth the price of a year's subscription." In so writing, C. S. Broadwell, Oakland, Cal., is referring to "The Story of Steel Treating" in our issue of Sept. 3. He is not alone in his opinion. "That story of steel treating was a classic," writes George L. Hurst, San Francisco.

H. E. Lewis, vice-president Bethlehem Steel Co., regards the article in question as "a splendid contribution to the history of heat treatment of steel." "It was a very wonderful piece of editorial work," says Bennett Chapple, of the American Rolling Mill Co., Middletown, Ohio.—And THE IRON AGE would merely add that if you did not read "The Story of Steel Treating" at the time it will be well worth your while to read it now.

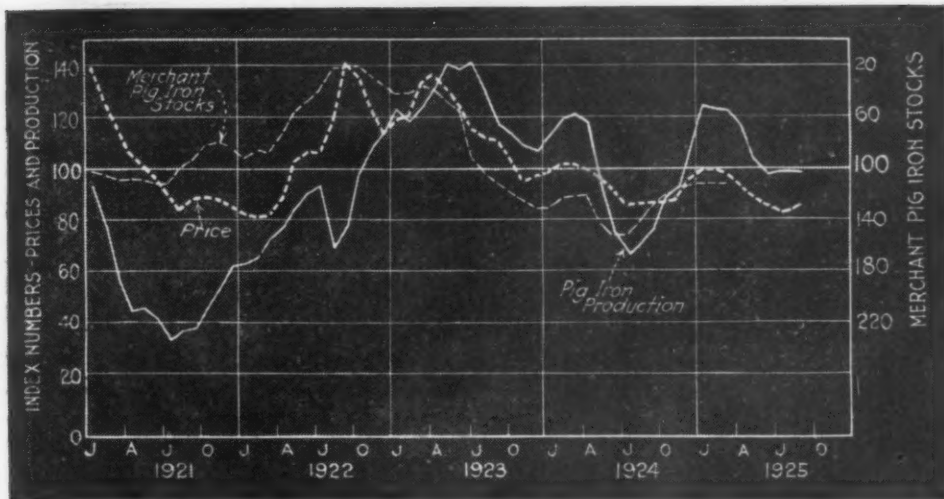


Fig. 2—The Balance of Probability Appears to Be Against Much Further Rise in the Price of Pig Iron; Some Deferred Buying Doubtless Remains and Is Likely to Raise the Average of Prices a Little Further, But Not Much

remains and is likely to raise the average of pig iron prices a little further—but not much.

Commodity Prices Turn Up

FIG. 3 shows the trend of various prices of interest to the producers and consumers of steel. The graph shows that:

1. After a small decline in August the general level of commodity prices partly recovered the loss during September. Bradstreet's index on Oct. 1 was 125.7 per cent of the 1921 average, against 125.1 per cent for the month preceding. The irregularity in the general price indexes has been chiefly due to breaks in the grain and cotton markets.

2. A general sagging trend in the markets for finished steel has been in force since January.

3. The recovery of pig iron prices is shown, following the lead of scrap; but as scrap has weakened, a checking of the advance in pig iron is indicated as probable. No improvement in the scrap market is yet in sight.

Several interesting conclusions may be drawn from Fig. 3. Note how faithfully the index of finished steel follows the general commodity price index, always declining not many months after it and rising sooner or later when below the general level.

Note again how close is the inter-relation among the various items which are portrayed in Fig. 3. This is especially true of the low points or bottoms. Usually

we find that Bradstreet's index reaches the bottom first and scrap next, although sometimes the two touch their low points at about the same time. Next, pig iron hits bottom, followed a little later by the price of finished steel.

This analysis may have some bearing on the present price outlook. Bradstreet's price index declined in August. The scrap market followed suit in September. This raises the question, will not the upward trend in the pig iron market soon cease? And another question is, will the price of steel not show greater firmness in the near future?—thus reflecting the preceding upturns in commodity prices, scrap, and iron.

Scrap Still Weak

THE narrow spread between pig iron and scrap is clearly illustrated in Fig. 3. Moreover, the current fact that scrap is weak and pig iron is strong appears. This is unusual, but a similar situation may be noted in the fall of 1919 and again in the spring of 1920, at both of which times scrap declined while iron steadily advanced. The conditions at those times, however, were essentially different from the present. Then the price of finished steel was rising and business was on the upswing in a major cycle. Now business is expanding but moderately. Commodity prices in general are irregular, and steel is barely steady. Thus it does not seem probable that this time the price of pig iron will carry through regardless of the scrap market.

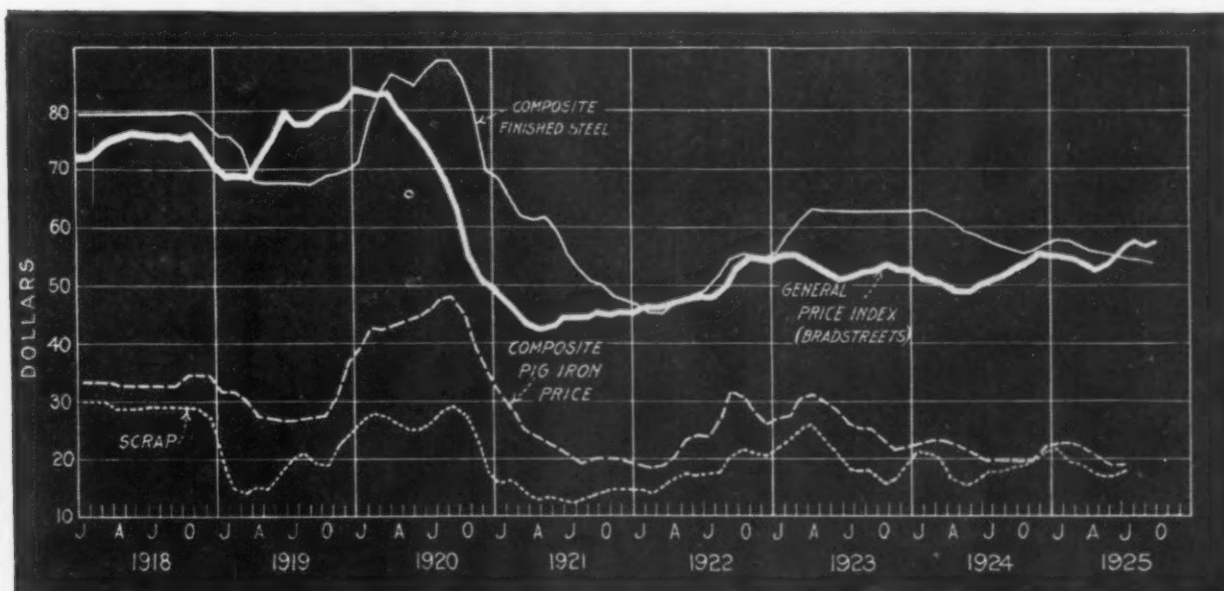


Fig. 3—The Bradstreet Composite Price Index Has Moved Up—This May Foretell a Corresponding Upward Turn in Steel Prices Later On

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Significance of Steel Tonnage

REFERENCE was made in this department of THE IRON AGE last week to the fact that the volume of industrial or commercial activity appears different when viewed from different angles. In some quarters it is claimed that business is not really very good after all.

The steel statistics indicate the contrary. They show that business is very active. A feature that needs to be considered just now is the quality or character of the steel tonnage, which is particularly favorable as an index to industrial and building activity. The mere tonnage figures are favorable, but there is more in the matter than that.

Production of steel ingots in September, 3,492,904 tons, was at a rate of 41,750,000 tons per annum, which is 7,000,000 tons, or 20 per cent, above the average in the six years, 1919 to 1924, inclusive. At the same time all the appearances are that the production is going entirely into current consumption. From the mere tonnage standpoint the showing is obviously favorable, or averages count for nothing at all in indicating "normal."

The production of steel is a very important industry in the United States, but the consumption of steel is much more important. It involves much more labor and much more expenditure of money. Now, there are different ways of using a ton of steel, and the amount of industrial activity, of labor employment and of money turnover, varies widely according to the way.

One of the outstanding comments on the steel market in recent months has been the meagerness of railroad buying. The consumption of steel by railroads involves less work and less expenditure than is the case with steel consumption in almost all other lines. Freight cars sell at a lower price per pound than almost anything else made of steel. Other things being equal, the less steel going into railroad consumption and the more going into other things, the more industrial activity is indicated by the steel tonnage.

It must be admitted that there is one point on the other side—that the large amount of tubular products sold for oil and gas wells and for

oil and gas lines does not represent much industrial activity of the kind that is most beneficial. The oil trade admits it would be better if fewer wells were sunk.

In general, however, the flow of steel from mills is into channels which represent much industrial activity in the use of the steel. Merchant bars pass to widely diversified and important uses, and the merchant bar tonnage is running strong at the present time. Sheets likewise represent many important and expensive uses and sheet tonnage is running heavy. In both cases it is a flow into numerous channels, not a flow of large tonnage into channels that are merely tonnage consumers. Even in the case of structural tonnage, which has been running high, the cost of the many large structures going up is vastly greater than the cost of the structural steel supporting them.

Thus, whatever may be said on the other side, it must be granted that both in tonnage and in character the current steel output indicates a great deal of commercial activity.

Another Foundry Year

SAND problems and foundry costs had the center of the stage at the foundrymen's annual convention last week in Syracuse. The sessions devoted to these two subjects drew the largest attendance, and first and last the visitor had 16 technical programs to choose from, with gray iron, steel and malleable foundry topics furnishing broad lines of division.

For many years sand has been merely "sand" to the foundryman. Only lately has he realized that the material surrounding his metal in the mold is almost as important to good castings as the metal itself. Meanwhile some of the best brains in the foundry industry have been delving into the mysteries of sand. Investigators are finding the problems complicated, but they have made good headway in their solution. Sand is being conserved, old sand is being revived and even synthetic sands are a possibility. Methods of test have been so far perfected that the foundryman is able to secure

dependable information concerning the physical properties of both molding and core sands. The net result is that costs are being reduced and the yield of good castings definitely raised.

In respect to foundry costs also the Syracuse meeting registered an advance. The industry has not yet found insurance against the owner who lightly enters upon a foundry career through the front door and after a few years is forced out with little choice of exits because his castings were sold in ignorance of their cost. But the campaign of education, under the lead of the association's committee on costs, has gone steadily forward, and the past year has been one of distinct progress.

At the same time the metallurgical side of the industry is not neglected. Last week's programs represent valuable additions to the literature of gray iron, steel and malleable castings, and the discussions gave one a new impression of the magnitude and diversity of the foundry industry, its rapid strides in the elimination of manual labor and the simplification of operations and of the abundant talent at work upon the problems of modern foundry metallurgy.

Length of Trade Movements

WHETHER the war would be followed by more or by less business than otherwise would have been transacted has been so much discussed that the question of the manner in which business is being done has received less attention than it deserved.

The superficial fact has been observed, of course, that the trade swings are of much shorter duration than those which occurred before the war. Little regard seems to be given, however, to the question whether there is underneath all these rapid fluctuations a grand swing, possibly of uncommon duration.

In the case of steel production, the five peaks before the war represented an average interval of a trifle more than three years from peak to peak. As steel production has been increasing lately, the measurement for these later times is best made from trough to trough. July, 1921, represented one, and July, 1925, the fourth trough thereafter; i.e., the interval has averaged one year instead of three years. The length of the periods of decreasing and increasing Steel Corporation unfilled tonnage has decreased greatly likewise, comparing pre-war times with recent years.

That there are substantial reasons for this change has been recognized. It is harder to throw the steel mills behind hand in deliveries and easier for them to catch up. But this alinement is not peculiar to steel. In other lines, which do not present statistics susceptible to such close study, there is also a much shorter cycle.

The big and fundamental point in all this is the question: Have business men a better understanding and a firmer grasp on the fundamentals of trade than before the war? Just after the war, when the thought that everybody was now going to have an easy time was struggling with the thought that everybody would have to be more frugal to compensate for the destruction, when the thought of still higher prices was contending

with the thought of pre-war prices being restored, it looked as if there would have to be floundering to extremes as an experimental search for the condition that would work out right. Does this recent shortening in the period of trade movements mean that we have found ourselves? If so, we are on a better basis, for the more frequently we have slack periods the easier it is to get through with them.

It does not follow, however, that we have become really accustomed to this sort of thing. The trade swings are not aimed at; it may be said, in a way, that they "just happen." Business men may still be looking for the longer swings to which they were accustomed. Each increase in business activity may be hailed as the beginning of a long swing, and each decrease the beginning of a long depression. We cannot feel that we have found ourselves in that respect.

At any rate, there is more to be learned than formerly from study of the trade statistics, because they show more points in a given length of time. One can compare the speed of one upswing or downswing with that of another, only a short time past, and the height and depth of the successive peaks and troughs.

In this connection it is noteworthy that practically all the economists and business forecasters who for a time after the war were dilating upon the importance of "the business cycle" have been paying much more attention lately to the detailed statistics of what is occurring day by day and week by week. Eventually we shall know whether there is a bigger cycle still, containing the smaller cycles we have recognized.

Laboratory Fatigue Tests

THAT the only laboratory in which the problems of repetition work and its resultant efficiency-killing fatigue can be studied with any hope of practical success is the industrial plant seems to be the opinion of British employers in the metal trades, as voiced in a recent editorial in *Engineering*. The only alternative is to carry industrial conditions into the science laboratory. A report has just been published of certain laboratory tests made by a woman psychologist at the University of Manchester. The truth of her conclusions is not disputed. Criticism is directed against what is held to be their futility.

The investigator took four girls, pupils in a school for unemployed women, and gave them routine work to do with a simple open-work pattern in coarse silk on canvas. It was a purposely meaningless, non-commercial task, but the experimenter held that it resembled in its monotony many factory operations. These girls were worked in two shifts of three hours each, four days a week, for two months, at an hourly wage, and then after an interval of six months a similar period with the same hours at piece work. One day a week the girls were permitted to converse and pause in their work at will. The next day they were made to labor continuously, but were given a 15-minute rest interval in the middle of each period. The third day they were forced to work at top speed without intermission and in

silence. On the fourth day there were five-minute rests at intervals. The deductions from the tests showed nothing particularly new. The day of intensive work proved fatiguing; piece work stimulated to greater effort, and so on. In commenting upon the test *Engineering* says:

"The industrially ridiculous hours and days of work at an extravagantly high rate take the whole of the operations outside the category of industrial work. Rest pauses may have their uses. Taylor showed this conclusively 30 years ago. But to be useful rest pauses are for persons under work conditions, not for those whose work more nearly resembled play, and is far from bringing the workers to anywhere near the limit of their strength.

"The report claims that the fantastic performance resembles many factory operations. It may be so; but it lacks the presence of independent moving machines, which in most operations introduces a break of monotony in every cycle, and it seems to give far less opportunity than normally occurs in practice for the enjoyment of the sense of speed of work."

This last thought is often lost sight of in con-

sidering repetition work. Even were an operator shut up in a room by himself, the moving machine would be his companion. This condition is more or less accentuated when people work at machines side by side. There is in some degree the social factor. Yet monotony can make itself felt to the detriment of the worker and his product, and in such cases most manufacturers are glad to find a remedy. But those who have studied the problem from the factory end maintain that no hard and fast laboratory formula can be applied, except as a suggestion upon which a working plan may be built to fit the individual case.

FRENCH consumption of high-grade manganese ore is notably large this year. To Aug. 1 the French imports were 261,400 tons, compared with 230,600 tons for the United States and 212,200 tons for Great Britain. Since these French receipts are considerably in excess of the ferromanganese needs of the country's steel industry, there is the surmise that French makers of ferromanganese are planning to compete with Great Britain in American and other foreign markets.

CORRESPONDENCE

Extravagance of the Half-Cent Rate

To the Editor: A suggestion to plant managers: Turn to your payroll for three weeks back and pick out a few of the time checks carrying rates of 37½c., 42½c. and 47½c. per hour. Ask your paymaster to figure up again the amount due on each card; one may be 55 hr. at 42½c., another 62½ hr. at 37½c., and so on. Follow these time cards to the cost accountant. Each day's time is spread over several orders in process. In one day those rates have been used ten to fifteen times in distribution of cost. Multiply this by a week and you have sixty to ninety times.

Now go back to your payroll and pick out some of the time checks carrying rates without the fraction, as 35c., 45c. and 50c. per hour. Follow these over the same route and you will see that the calculations are more quickly made. The time spent in a month dealing with these half cents will astonish you. And why? Just because some years ago we divided a man's daily rate by ten and began using hourly rates which in some cases resulted in a figure carrying the fraction.

Now that so many trades are employed on the hourly basis, it is high time to scrap those half-cent rates. You could take an average payroll of 300 men and add the half cent to the odd rates and actually save money because of the accounting expense eliminated. But at least we can hire the next man at 47 cents or 48 cents instead of 47½c. Just the pen and ink work alone, used in affixing that ½ every time the rate is applied, is an item.

Waste is the chief cause of poverty. Surely there is waste here. Imagine the economic significance of discontinuing use of the half cent on hourly rates if this were done by every plant interested.

G. J. McDONNELL.

Erie, Pa.

For exhibits at the National Exposition of Power and Mechanical Engineering to be held from Nov. 30 through Dec. 5, all of the first two floors of the Grand Central Palace, New York, and 90 per cent of the space on the third floor has been contracted for.

FAR EAST MARKET QUIET

Small Rail Tonnage Placed Here—American Importers Quote on Reinforcing Bars

NEW YORK, Oct. 13.—Inquiry from foreign markets continues light. Even the usual volume of inquiries from the larger companies in Japan is considerably diminished and the recent activity in the Chinese market is apparently declining. An order of size booked by an American exporter to China calls for about 400 tons of copper wire for a transmission line between Tien Tsing and Shanghai. Competition from both British and Japanese makers is understood to have been keen. The volume of wire shorts on the market is reported by exporters to China as small and the prices asked by American mills are generally slightly higher than the Chinese merchants are willing to pay. Much the same situation prevails in tin plate waste.

The two and a half miles of 100-lb. rails for which the Keh-Hin Electric Railway in Japan has been in the market are reported placed with an American exporter dealing largely with Japan. The 660 pieces of locomotive boiler tubes for the South Manchuria Railway Co. are also understood to have been awarded.

Importers of steel in New York have manifested interest recently in a total of about 5000 tons of reinforcing bars for a sewer in Brooklyn, the first section of which, let about a year ago, took about 6500 tons of bars furnished from a Belgian mill by William H. Muller & Co., 11 Broadway, New York. Award of the present contracts covering sections 3 and 4 of the sewer is expected by the end of this month.

The Bureau of Standards, Washington, is often asked to make tests of engineering materials for commercial organizations and individuals. Under the law the bureau makes many tests for the Government departments, but owing to the large amount of such work it does not make tests for individuals if other laboratories can do the work. The bureau is now preparing a list of physical, mechanical and metallurgical laboratories so as to be able to direct individuals to such laboratories. To any one who can give information about laboratories the bureau will be glad to send a questionnaire on application.

PROTEST SOUTHERN RATES

Railroads Agree with Shippers in Opposing Class Rate Findings

WASHINGTON, Oct. 13.—Following similar action by Southern iron and steel producers, a number of Southern railroads have filed a brief with the Interstate Commerce Commission, protesting against its findings in connection with the Southern class rate investigation. Numerous objections are made by the carriers and they are stated in emphatic terms. Among other things, protest is made against a proposed differential combination basis and to the differentials themselves, which it is claimed will create numerous fourth class section violations and discriminations. While designed to remove undue preferences to the gateways and undue prejudices to points south of the gateways, the carriers point out, this basis may actually create more discriminatory situations than it attempts to prevent because it results in an adjustment that will be preferential to points in official territory and prejudicial to the gateways. After stating other reasons for protesting against the findings, the Southern carriers said that they are revolutionary in the extreme and cannot possibly be permitted to stand. It is asserted that the findings, if made effective, would do lasting injury to the carriers, who "decline to share responsibility with the commission for the report it has issued."

Modification of the commission's decision was petitioned by Southern iron and steel manufacturers following a meeting at Birmingham on Sept. 25. It was stated that the proposed rates are unduly prejudicial to Southern shippers and unduly preferential to Northern shippers. This opinion is based on the claim that the maximum scale of class rates shown in the report does not observe a proper relationship to distances. The rates for the shorter hauls, it is charged, are relatively too high, as compared with those for the longer hauls. Furthermore, it is alleged, the plan of graded rates proposed by providing as maxima the combination of local rates between Northern and border points and the differential scale "intensifies and greatly aggravates the undue discrimination against Southern shippers and lays an unnecessary and unjust burden upon Southern industry."

Carriers in Central Freight Association and Illinois Freight Association territories also have protested against the finding and asked for modification. In an exhaustive presentation of their side of the case, they object to the differentials, the mile scale basis suggested, and say that there was no justification for the commission to discard the system of rates they had prepared. It is stated also that it would be physically impossible to prepare the tariff changes by Jan. 1, 1926, the proposed effective date of the readjustment.

More Forward Buying Reported at Youngstown

YOUNGSTOWN, Oct. 13.—With new business coming in at a better rate recently, Mid-western independent steel makers are accumulating some tonnage, according to local sales executives. The "hand-to-mouth" buying policy followed for so long in some lines, notably sheets, is not so strictly observed.

Because of the comparatively higher pig iron prices in the Chicago area, sellers in this district and at Cleveland are receiving a larger volume of inquiry than usual from melters in Michigan. Valley merchant iron interests have sold in recent weeks a considerable number of small tonnages for shipment to Michigan foundries.

One of the principal Valley sheet makers reports sales of small quantities of galvanized sheets at 4.30c. per lb., an advance of \$2 per ton above the recent market. This mill marked up quotations because of rising spelter costs.

A sheet producer with 16 of 18 mills under power believes business will be in sufficient volume to main-

tain that operating rate through the remainder of the quarter.

Merchant steel bars are firm in this area at 2c. per lb., and on new business customers heretofore receiving some preferential treatment are obliged to pay this figure.

The tin plate industry is running into its period of seasonal decline in new business, though production is being well maintained for the time being.

299 Tack Sizes Eliminated at Standardization Conference

WASHINGTON, Oct. 13.—Effective on Jan. 1, 1926, on new production, and on April 1 for existing stocks, reduction in sizes of tacks from 485 to 186 and in packing weights from 423 to 127 was determined upon at a conference of tack makers, distributors and representatives of consumers held under the auspices of the Division of Simplified Practice, Department of Commerce, on Wednesday, Oct. 7. The conference also adopted definitions as to the methods of measurement and steps to discourage the use of still further varieties which have become obsolete.

The meeting determined upon the elimination of the terms American cut, Swedes cut, baling, canvas, cheese-box, curtain, shade, broom, stamp, gagers, railroad, roofing, looking-glass, truckers and berry-box tacks. It was also voted to do away with a name which should give a number of ounces, as "6-oz. carpet tack," and to adopt a designation of a number and length. The term 6-oz., it was stated, originated in the days when tacks were hand made and 1000 tacks were expected to weigh 6 oz. The term "trimmers tacks" supplants the names American cut and Swedes cut.

The conference also went on record as favoring standard measurement rules as developed by the Bureau of Standards which provide that: "All tacks are measured under head to end of point. Brad head, flat countersunk head, headless, and cement coated nails are measured over all, i. e., top of head to end of point. Oval and round countersunk head nails are measured from top of countersink (largest diameter) to end of point."

Ford Production Over 300,000 Cars for September

September production of cars and trucks was at a record rate for that month for many of the large factories, and the level has been fairly well maintained for the last two weeks, according to *Automotive Industries*. From now on, however, except in the case of Ford, the general tendency will be gradually downward, with probably a sharp drop next month or in December.

Preliminary estimates of the production total for September show a gain of about 8 per cent over August for the industry as a whole, with Ford again excepted. In the case of Ford, the month showed an enormous increase, so that the final figures should be well over the 300,000 mark, against approximately 260,000 for August.

National Malleable & Steel Casting Case Still Pressed

WASHINGTON, Oct. 13.—The new policy of the Department of Justice in regard to the dismissal of petty complaints of violations of the antitrust laws will not affect the proceedings against the National Malleable & Steel Casting Co., Cleveland, according to the annual report issued by Asst.-Atty.-Gen. William J. Donovan here today. Speaking of this case the annual report says: "The Government is gradually winning its fight for the removal of 35 defendants, residing beyond the jurisdiction of the Court, who are resisting removal for trial under the indictment pending in the Northern District of Ohio."

SHIPS NAILS IN BOXES

Mexican Plant Builds Up Flourishing Business by Studying Its Market

Shipping wire nails in boxes, instead of kegs, is a method employed by the Mexico Hardware Co. at its plant in Ciudad Juarez, Mexico. Boxes, it is said, are less subject to breakage en route and also store better and in a smaller space than kegs. Another important consideration is that the retail dealer in Mexico finds a ready sale for empty boxes, while there is no demand for empty nail kegs. This is seemingly an inconsequential item, but represents a small additional profit to the dealer that is appreciated.

The nails are packed 100 lb. to the box, which is a departure from the custom of other nail manufacturers in Mexico whose packages contain 50 kg., or approximately 110 lb. However, the Mexico Hardware Co. buys all of its wire on the open market in the United States, and decided to adopt the American standard size of package. This aids in keeping closer tab on manufacturing costs, and it has been found that the Mexican trade has taken very readily to the idea.

About two years ago the Mexican Government fixed higher import duties on most all manufactured articles of iron and steel. This was done to protect plants already in operation in Mexico and to encourage the establishment of new industries. The duty on wire nails was placed at 40 centavos per kg., or approximately 10c. per lb., and that on galvanized wire at only 9 centavos per kg., or about 2c. per lb. in American money. This wide difference between the duty on the raw material and the finished product caused S. R. Silva, president Mexico Hardware Co. to establish a

wire nail plant in Ciudad Juarez, Mexico, just across the Rio Grande River from El Paso, Tex., where the company maintains its head office.

At the beginning only four machines were installed, all made by the National Machinery Co., Tiffin, Ohio. These machines turned out only the ordinary sizes of nails used in Mexico, but this preliminary experience was so successful that other machines were added from time to time until ten are now in operation. A staple making machine was also installed, giving the plant a total daily capacity of about 20,000 lb. of nails and staples. Nails ranging in size from the ordinary shingle nail to 40 penny are made, and it is planned to add another machine to make nails as large as 60 penny, for which size there is a limited demand in Mexico.

Although the plant has been in operation less than one year a flourishing business has been built up all over Mexico. Nails for the Pacific Coast are shipped through the United States in bond.

It is noteworthy that all staples for the Pacific Coast trade must be made from galvanized wire, while those for the dry section of northern Mexico are manufactured from plain black wire. By paying attention to these small details of the trade's demands in different sections of the country the company has not only been able to satisfy its market, but to effect a saving in manufacturing costs that in the long run is not insignificant. Added to the lower cost of plain wire is the fact that the duty is also a trifle lower than on the galvanized product.

The plant is operated exclusively by Mexican labor, as is also a small factory that makes all boxes required, the box shoos being purchased already cut to proper sizes.

Many Spade and Shovel Sizes to Be Dropped

WASHINGTON, Oct. 13.—Representing a total elimination of 43 per cent in sizes of shovels, spades and scoops by reducing the present variety from 223 to 127, recommendations will be presented for the action of a general conference of manufacturers, distributors and users at the Hotel Ambassador, Atlantic City, Oct. 19. The meeting, to be under the auspices of the Division of Simplified Practice, Department of Commerce, will be presided over by A. E. Foote of the Division and will be held in connection with the joint meeting of the American Hardware Manufacturers' Association and the National Hardware Association. The recommendations to be presented by the Committee on Simplification propose the elimination of 53 sizes out of the 120 now made in 21 types of shovels; 10 of the 27 sizes in eight types of spades and 33 of 76 types of scoops.

Manufacturers, it has been announced, are also in favor of making but three grades of shovels instead of four and are in favor of fixing a minimum gage of material to be used.

Youngstown Sheet & Tube Co. Finds Outlook Improved

YOUNGSTOWN, Oct. 13.—Indicating its confidence in the maintenance of satisfactory conditions in the iron and steel industry, the Youngstown Sheet & Tube Co. has purchased or ordered to be purchased raw materials required over the next six months in manufacturing processes, including scrap manganese, spelter and other iron and steel-making supplies. It is indicated that the company paid \$18 to \$18.50 per ton in the Youngstown district for heavy melting scrap, \$16.50 in the Chicago territory, and the same prices for hydraulically compressed sheets. In some of its important producing lines, the company is booked for the remainder of the year. Somewhat higher prices are now asked for sheets, strip steel, wire and some other finished products.

Prior to his departure this week for a short stay at White Sulphur Springs, Va., President James A.

Campbell of the Youngstown Sheet & Tube Co., expressed his confidence in the stability of current conditions. "I can see nothing at this time to interfere with good business," he said. "The farmers are buying well and will continue to do so, I believe. The railroads will be heavy buyers, while the automotive industry is absorbing more and more steel. Oil country pipe business has slackened to some extent, but this condition is more than offset by better orders for line pipe. Last week my company secured a large tonnage of line pipe. In the meantime, merchant pipe buying is good."

The Sheet & Tube Co.'s October shipments are running above those for September, which were 20 per cent above the July-August average.

Bon Air Company Merger

The Bon Air Coal and Iron Corporation, Nashville, Tenn., has purchased the properties of the Tennessee Consolidated Coal Co. and the Chattanooga Gas & Coke Co., paying \$1,250,000 for each. The sale of the latter is subject to ratification by stockholders before October 20. The deal is part of a plan for the merger of several coal and iron companies. Other companies involved are the J. J. Gray, Jr., Foundry, Rockdale, Tenn., already acquired by the Bon Air company, and the Southern Ferro-Alloys Co., owning plants at Chattanooga and Cleveland, Tenn. Negotiations for the latter company are now in progress. William J. Cummins, vice-president and general manager of the Bon Air company, will be chairman of the executive committee of the new company. It is understood that William Wrigley, Jr., Chicago; Col. Jacob Ruppert, New York, and John McE. Bowman, New York, are associated with Mr. Cummins. The manufacture of chemical by-products from coal is one of the proposed activities of the new corporation.

Employees in 210 iron and steel establishments in August numbered 265,591, according to figures of the Bureau of Labor Statistics. This is a fractional increase over July. Total payroll for one week in August was \$7,781,914, compared with \$7,376,134 in July, a gain of 5.5 per cent. The individual pay envelope was larger by about the same ratio.

STEEL VIA OHIO RIVER

Barge Shipments from Pittsburgh Emphasized at Ohio Valley Meeting

The importance of the Ohio River as a carrier for the products of steel plants in the Pittsburgh district and of other mills situated on its banks was emphasized at the thirty-first annual convention of the Ohio Valley Improvement Association, which was held aboard the steamer Cincinnati, October 6 to 8, while en route from Pittsburgh to Cincinnati.

Dedication of dams Nos. 34 and 36, the former at Chilo, Ohio, and the latter at Coney Island, marked the completion of the canalization of the river with a 9-ft. stage from Pittsburgh to Louisville. Delegates approved a resolution calling upon Congress to adhere strictly to its present program, whereby the canalization of the entire river from Pittsburgh to Cairo will be finished within four years. A resolution was adopted urging municipalities to construct freight terminals for the interchange of traffic between railroads and river craft.

Acting Secretary of War Dwight F. Davis, Senator D. H. Reed, Senator Frank B. Willis, Congressman C. A. Newton, Brig. Gen. Edgar Jadwin, assistant chief of United States engineers, and Senator S. D. Fess were among the convention speakers. Homer Williams, president Carnegie Steel Co., accompanied the party from Pittsburgh to dam No. 3. A. E. Crockett, Jones & Laughlin Steel Corporation, and D. Eppelsheimer, American Rolling Mill Co., were also on the convention program for short addresses.

Delegates witnessed three barge launchings which had been staged for their benefit. At the Riter-Conley Co. ways, about 14 miles below Pittsburgh, one barge slipped into the water, while at the American Bridge Co. ways at Ambridge, Pa., two steel barges were launched as the Cincinnati passed.

Steel plants are utilizing the Ohio River more and more each year for shipments to Cincinnati, Louisville, Memphis and even to New Orleans. Touching upon the ultimate development of the inland waterway system, acting Secretary of War Davis said:

"The Ohio will be finished in five years, and it seems safe to predict that it will not be long thereafter when we shall have a through arterial system connecting Pittsburgh, New Orleans, Birmingham and St. Louis. This will be followed by extensions in the South to Texas by way of the intra-coastal waterway, and in the North to Chicago, St. Paul and Kansas City. Connections later will be had with the Atlantic inland waterway through Chicago, the Great Lakes and the Erie Canal. As the main lines are completed, the navigable tributaries will become practical parts of the system and will serve their natural spheres of usefulness. This will place the services of the large arterial waterways at the disposal of a large part of the area of the country served by rail and truck."

Mahoning Valley Steel Output at 85 Per Cent

YOUNGSTOWN, Oct. 13.—Production of iron and steel continues at an average rate of 85 per cent in the Mahoning Valley. The Youngstown Sheet & Tube Co. is averaging 75 per cent in this district, the Republic Iron & Steel Co., 80 per cent, and the Sharon Steel Hoop and Trumbull Steel companies, close to a normal rate. The Carnegie Steel Co. has reduced active steel ingot capacity to 88 per cent, from 92 per cent last week and 96 per cent two weeks ago.

In the Chicago district, the Sheet & Tube company has blown in another merchant blast furnace, giving it six active stacks out of eight in that territory, and 11 out of 17, including its Youngstown district furnaces. Its steel plant at Indiana Harbor, Ind., is running at 80 per cent of capacity and its rolling mills at the same rate.

In the Mahoning Valley, non-integrated sheet plants show the following operations: Newton Steel Co., all 20 mills at Newton Falls, Trumbull County; Falcon Steel Co. and Mahoning Valley Steel Co., eight mills each, representing their complete capacities; Thomas Sheet Steel Co., nine of 12 mills, and the Waddell Steel Co., six of seven. Out of a total of 127 sheet mills 119 are

active in the Mahoning Valley. Thus the high rate of the year attained two weeks ago is being maintained.

Schedules of the Republic Iron & Steel Co. show four blast furnaces active, 12 open-hearth furnaces, the Bessemer department (two turns), the blooming mills, the 14-16-in. bar mill, five light bar, five tube, two skelp, one plate and 16 sheet mills. The A. M. Byers Co. is operating 88 puddle mills at its Girard works, its bar mill on full and its plate mill on short turns. The Trumbull Steel Co. is running 15 sheet and 29 tin mills, three hot strip mills, and its cold strip department.

The Youngstown Steel Car Co., Niles, Ohio, in which the Youngstown Sheet & Tube Co., Youngstown, is an important stockholder, has received an order from the Pennsylvania Railroad, to repair 1000 steel cars. This work is expected to provide employment for 300 men for several months. This business, with other orders impending, will enable the company to operate close to capacity through the winter, states L. C. Wilkoff, secretary.

Brown, Boveri & Co. Completes Financing

The American branch of Brown, Boveri & Co., the Swiss electrical manufacturers, which is to be known as the American Brown, Boveri Electric Corporation, has completed its financing for the plant and equipment of the New York Shipbuilding Corporation at Camden, N. J. The American Brown, Boveri Electric Corporation took over the financial organization of the New York Shipbuilding Corporation through a transfer of stock. In addition 260,000 new shares were offered for public subscription and quickly sold.

The new company has absorbed the Condit Electrical Mfg. Co., Boston, and the Scintilla Magneto Co., which has a plant at Sidney, N. Y. The Condit company has been engaged in the manufacture of electric switches and other electrical apparatus for many years, while the Scintilla Magneto Co. recently established a plant in this country for the manufacture of magnetos. This company was a subsidiary of Brown, Boveri & Co. of Switzerland.

It has been decided that the shipbuilding and steel fabricating work now going on at the plant of the New York Shipbuilding Corporation will be continued by the new company, which will still have ample facilities for the building of electrical machinery. About \$500,000 will be expended on the plant and equipment to make it suitable for the new manufacturing processes.

Large Increase in Steel Corporation's Unfilled Orders

Unfilled orders on the books of the United States Steel Corporation as of Sept. 30 aggregated 3,717,297 tons—an increase of 204,494 tons from those which remained unfilled on Aug. 31. This is the first increase since February. It compares with a decrease in March of 421,207 tons, which was the first decline since last July, with 416,996 tons in April, with 396,768 tons in May, with 339,342 tons in June, with 170,991 tons in July and with only 26,664 tons in August. A year ago the unfilled business was 3,473,780 tons, or 243,517 tons less than for Sept. 30, this year. Following is the unfilled tonnage as reported by months, beginning with January, 1923.

	1925	1924	1923
Jan. 31.....	5,037,323	4,798,429	6,910,776
Feb. 28.....	5,284,771	4,912,901	7,283,989
March 31.....	4,863,564	4,782,807	7,403,332
April 30.....	4,446,568	4,208,447	7,288,509
May 31.....	4,049,800	3,628,089	6,981,351
June 30.....	3,710,453	3,262,505	6,386,261
July 31.....	3,539,467	3,187,072	5,910,763
Aug. 31.....	3,512,903	3,289,577	5,414,663
Sept. 30.....	3,717,297	3,473,780	5,035,750
Oct. 31.....	.....	3,525,270	4,672,825
Nov. 30.....	.....	4,031,969	4,368,584
Dec. 31.....	.....	4,816,676	4,445,339

The high record in unfilled orders was 12,183,083 tons, at the close of April, 1917. The lowest was 2,674,757 tons, on Dec. 31, 1910.

Marked Expansion of New England Power Consumption

WORCESTER, MASS., Oct. 10.—The New England Power Co., which furnishes power, chiefly hydro-generated, for the industries of a large part of New England, including an immense diversity of product and involving the employment of upward of 150,000 people, has distributed, in the first eight months, 24 per cent more current for manufacturing purposes, to the same identical customers, than in the same period of 1924. In the comparison all new customers, and all cases where old customers have taken on additional power for departments hitherto otherwise supplied, have been eliminated. In this way full correction is made for the factor of natural growth of the company's business. The actual gain in volume of current sold for industrial purposes is much greater.

The total current consumed by these industries this year was 175,053,000 kwhr., compared with 140,445,000 kwhr. in the eight months of 1924. This year metal industries took 43,887,000 kwhr., compared with 36,610,000 kwhr., a gain of 19.9 per cent; textiles, 69,021,000 kwhr., compared with 49,022,000 kwhr., a gain of 40.8 per cent; paper making, 37,583,000 kwhr., compared with 34,118,000 kwhr., a gain of 10.1 per cent; rubber industries, 8,676,000 kwhr., compared with 6,249,000 kwhr., a gain of 38.8 per cent, and miscellaneous, 15,886,000 kwhr., compared with 14,446,000 kwhr., a gain of 10 per cent. Taking a similar basis of comparison, the total gain made by the company was from 283,439,000 to 335,129,000 kwhr., or 18.2 per cent.

Total Industrial Gain 37 Per Cent

Including new customers, the gain in current supplied metal industries was from 36,610,000 to 53,090,000 kwhr., or 45.1 per cent, and in all industries from 141,123,000 to 193,366,000 kwhr., or 37 per cent. The total power sold for all purposes advanced from 284,117,000 to 353,442,000 kwhr., or 24.4 per cent. The increase in demand for manufacturing power has been much greater than for public utilities, railroads and municipalities.

The experience of the New England Power Co. in the increasing demand for industrial power for the first three months of 1925, compared with the same period of 1924, was published in THE IRON AGE, April 30, page 1287. The marked improvement in New England business then noted from this business barometer has continued without sign of recession.

Everett Furnace Modernized

The Everett-Saxton Co. has been organized under the laws of Pennsylvania to take over the blast furnace, coal and coke property purchased by W. S. Pilling and Charles J. Webb at a receiver's sale early last summer. This property, formerly owned by the Joseph E. Thropp Co., consisted of two blast furnaces, the Everett furnace and the Saxton furnace, also coal and coke properties. The Saxton furnace has been scrapped, but the Everett furnace has been modernized and equipped with casting machine, turbine blower and other improvements and will be put in blast when business warrants. The coal mines and limestone quarries are now being operated.

Winter Construction on the Increase

The building season is gradually being lengthened as the result of a drive undertaken by the construction industries in cooperation with the Department of Commerce. This fact has been established through a survey made by the division of building and housing of the department at the direction of Secretary Hoover. Reports from contractors in 16 large cities show that payrolls and material purchases were relatively larger in the winter months of 1924 than in those of 1923. The 1923 figures in turn showed an increase over 1922. Payrolls and material bills are measures of building activity which follow actual work very closely.

Changes in general business conditions and a difference in the weather undoubtedly had some share in the result. But making allowance for such factors, and improvement in the relative amount of winter building is apparent. There are already favorable indications for the coming winter. The August figures for contracts awarded for all classes of construction have proved to be the highest ever known. Many of the operations represented by these contracts are expected to be carried over into the cold weather.

Caution in Using Compressed Gas Cylinders

Interstate Commerce Commission regulations pertaining to the shipment of dangerous articles by rail include specifications for the manufacture and testing of cylinders used in transporting gases compressed to pressures over 25 lb. per sq. in. The regulations prescribe certain cylinder test requirements which must be complied with before the cylinders are acceptable in interstate or intrastate commerce by freight or express. Tests are considered necessary, to reduce to a minimum the hazard of having in circulation cylinders not in proper condition to withstand the service for which they are intended. The gases commonly shipped in these cylinders, and the intervals at which the cylinders must be tested, are as follows:

Name of Gas	Intervals at Which Cylinders Should Be Tested
Acetylene	Once before putting into service
Anhydrous ammonia	Every 10 years.
Carbonic gas	Every 5 years.
Chlorine	Every 5 years.
Ethylene	Every 5 years.
Helium	Every 5 years.
Hydrogen	Every 5 years.
Hydrocarbon gases (other than Acetylene)	Every 5 years.
Methyl Chloride	Every 5 years.
Nitrous Oxide	Every 5 years.
Oxygen	Every 5 years.
Sulphur Dioxide	Every 5 years.
Non-liquefied gases with pressures not over 300 lb.	Once

When cylinders have been tested, the month and year in which the test was made must be stamped into the metal of the cylinder near the top, i.e., a cylinder tested in March, 1925, would bear the marking "3-25."

To safeguard the interests of all concerned with cylinders charged with compressed gases, those who use the cylinders should observe the markings showing the dates of test. If at any time cylinders are found which are overdue for test, the owner should be notified promptly. The use of cylinders not so tested, whether in transportation or in service, is unwarranted, and all those dealing with compressed gases should be actively interested in preventing their use.

Shipbuilding at Low Point

Shipbuilding throughout the world is at the lowest point since the World War, according to a statement issued by Lloyd's Register of Shipping. There has been a decline of more than 150,000 gross tons in world ship construction in the past three months. Italy and Holland show an increase in work in hand, but in all other countries there were decreases. That in Germany was greatest, more than 100,000 tons. The decline in the United States was 22,000 tons. The world total of ships now under construction is 2,206,905 gross tons as of Sept. 30, 1925, which compares with 2,369,881 on June 30, 1925.

Wire rope prices have been advanced by two makers, but larger producers have not yet made any change. This product is sold on a list and discount basis and the commonly used grades now are quotable as follows: Improved plow steel, 15, 10 and 5 to 20, 10 and 5 per cent off list; ordinary plow steel, 27½, 10 and 5 to 35, 10 and 5 per cent discount, and crucible steel 10, 10 and 5 to 20, 10 and 5 per cent discount.

SEPTEMBER STEEL OUTPUT

Increase Over August 2648 Tons Per Day or
About 2 Per Cent

Only a moderate increase in the steel ingot production of the country was registered in September. At 134,342 gross tons per day the September output was 2648 tons per day in excess of that of August, or an increase of about 2 per cent. This compares with an increase of about 11 per cent in August over July. In July there was a decrease from June of 7.2 per cent.

The statistics of the American Iron and Steel Institute show that the September output of the companies which made 94.43 per cent of the country's total in 1924 was 3,298,349 tons. Assuming that the 5.57 per cent not reporting produced at the same rate, a total September production is indicated of 3,492,904 tons. The corresponding annual rate is about 41,780,000 tons, or about 77 per cent of capacity.

The table gives the production by months of the different kinds of steel, together with the estimated daily rate for all companies.

Monthly Production of Steel Ingots, Reported by Companies
Which Made 94.43 Per Cent of the Steel Ingot
Production in 1924

		(Gross Tons)			
Months,	Open-			Calculated	Approx-
1925	Hearth	Bessemer	Other	Monthly	imate
				Production	Daily
				All	All
				Companies	Companies,
					Gross Tons
Jan. . .	3,262,748	689,996	11,960	4,198,564	155,502
Feb. . .	2,931,964	602,042	13,014	3,756,243	156,510
March. .	3,336,169	614,860	13,633	4,198,520	161,482
April. .	2,857,802	515,715	14,182	3,587,524	137,982
May . .	2,754,130	497,708	13,790	3,458,253	133,010
June . .	2,538,988	476,945	12,490	3,207,056	123,348
July . .	2,444,969	457,095	13,547	3,087,590	118,753
Aug. . .	2,696,667	523,734	12,914	3,424,034	131,694
Sept. . .	2,737,251	547,121	13,977	3,492,904	134,342
9 mos. .	25,560,688	4,925,216	119,507	32,410,688	139,102
1924					
Jan. . .	2,766,534	667,032	12,577	3,649,913	135,182
Feb. . .	2,902,641	695,905	14,085	3,826,246	153,050
March. .	3,249,783	706,801	15,260	4,206,699	161,796
April . .	2,575,788	573,381	12,356	3,348,466	128,787
May . .	2,060,896	426,099	6,648	2,640,034	97,779
June . .	1,637,660	310,070	2,622	2,065,676	82,627
July . .	1,525,912	241,880	5,162	1,877,789	72,223
Aug. . .	2,042,820	361,781	5,764	2,552,891	98,188
Sept. . .	2,252,976	409,922	6,864	2,827,625	108,755
9 mos. .	21,015,010	4,391,871	81,338	26,995,339	115,365
Oct. . .	2,505,403	438,468	7,058	3,125,418	115,756
Nov. . .	2,479,147	459,349	8,403	3,121,149	124,846
Dec. . .	2,811,771	546,506	11,707	3,569,251	137,279
Total . .	28,811,331	5,836,194	108,506	36,811,157	117,984

September Orders for Electric Hoists

Members of the Electric Hoist Manufacturers' Association report that the number of hoists ordered in September was 9.375 per cent less than the number ordered in August, 1925. However, the value of hoists ordered during September was 8.4372 per cent greater. Shipments in September were 21.052 per cent less than those of the previous month.

Buys Controlling Interest in California Nut and Bolt Concern

LOS ANGELES, Oct. 10.—Control of the Southern California Iron & Steel Co., one of the largest nut, bolt and rivet manufacturers in the West, passed to the Pacific Coast Steel Co. of San Francisco on Oct. 6 with the resignation of A. C. Denman, Jr., president and general manager of the Los Angeles concern for the past 13 years.

The Pacific Coast Steel Co. began the acquisition of stock in the Southern California Iron & Steel Co. last January and several weeks ago acquired a controlling interest. Mr. Denman closed out his own stock holdings several months ago but retained his position as president and general manager until his resignation on Oct. 6. He will retire from active participation in the steel industry. No successor to Mr. Denman has

been selected as yet but announcement of the choice of the directing head will be made at the next meeting of the board of directors at the close of the month. Meanwhile, E. S. Houdelette, vice-president, and Harvey C. Jones, controller, are supervising the management of the concern.

Columbia Steel Corporation Acquires Utah Iron Mines

SAN FRANCISCO, Oct. 10.—The Columbia Steel Corporation has acquired the extensive Milner-Dear-Lerch iron ore holding at Iron Mountain, Utah, consisting of 51 claims and covering 921 acres. Mining operations will probably be started next spring. Geologists estimate that these deposits contain many million tons of high grade hematite ore, averaging 58 per cent iron. They lie seven miles south of Iron Springs near Cedar City. The Union Pacific Railroad, which has a branch to Iron Springs, plans to extend it seven miles farther as soon as mining operations begin and transportation is needed.

Purchasing Agents Hold Iron and Steel Conference

As a part of the sixth district conference of the National Association of Purchasing Agents to be held in Springfield, Ohio, Oct. 16 and 17, buying executives will hold an iron and steel meeting to discuss the problems of the metal purchaser. B. F. Downey of the Yost Superior Co., Springfield, Ohio, maker of coiled wire springs and washing machines, will preside and F. A. Miller, Buckeye Steel Castings Co., Columbus, will speak on Oct. 16. A number of steel men will discuss purchasing problems in consuming industries on Saturday, Oct. 17, including Newman Eberols, American Rolling Mill Co., Middletown, Ohio; A. G. Hopcraft, Ferro Foundry & Machine Co., Cleveland; O. A. Ahlers, International Tool Co., Dayton; Edward Montanus, Springfield Machine Tool Co., Springfield; B. F. Kauffman, James Leffel Co., Springfield, and H. O. Miller, American Rolling Mill Co., Middletown.

Draftsmen Needed for Naval Construction

WASHINGTON, Oct. 12.—The United States Civil Service Commission states that a number of naval establishments are in need of draftsmen in connection with naval construction authorized by Congress last winter. The needs lie in New York and Norfolk navy yards and the Naval aircraft factory at Philadelphia. Application blanks may be obtained from the commission at Washington.

To Speak on Research and Engineering

After the dinner to be held by the Engineers' Club of Philadelphia on Tuesday evening, Oct. 20, E. B. Craft, executive vice-president of the Bell Telephone Laboratories will deliver an address on "Today's Research—Tomorrow's Engineering." The address will tell of some of nature's secrets being laid bare by research and how industry will profit by them.

The Crescent Pipe Line Co., Pittsburgh, has sold 250 miles of 5-in. and 6-in. wrought iron pipe to the Tri-State Pipe Co., Bellaire, Ohio. The Crescent Company will lift about 50 miles of it this fall and the remainder in the spring.

The McKinney Steel Co., Cleveland, has closed its Pittsburgh district sales office, which has been in charge of James S. McKesson, assisted by George W. Crowl, and the business of this office hereafter will be handled from the company's general offices in Cleveland, where Mr. McKesson and Mr. Crowl will be located.

British May Pool Tin Plate Output

Pig Iron Continues Weak in English
Market—Galvanized Sheets Show
Strength—Dullness in Germany

(By Cablegram)

LONDON, ENGLAND, Oct. 12.

PEASE & PARTNERS, LTD., Middlesbrough, have sold to the United States 35,000 tons of special Cleveland pig iron. Otherwise, the foundry iron market is quiet. Domestic consumers' demand has dwindled. Hematite is steady, on well-placed order books and limited output.

Foreign ore is idle. Bilbao Rubio is held nominally at 20s. (\$4.84) c.i.f. Tees.

Finished steel is dull and easier; export demand is poor.

September exports of pig iron amounted to 27,034 tons, of which 1825 tons went to the United States. Total iron and steel exports were 273,237 tons.

Sheets and Tin Plate

Tin plate is firm, with more makers asking up to 19s. 9d. (\$4.78) basis, I C, f.o.b., for next year. There is a moderate export demand, without special features. No decision has been reached regarding the pooling scheme.

Galvanized sheets are strong on good buying by Asian markets, especially India. Thick-gage mills generally are sold out to the end of December.

Black sheets are steady with moderate sales to Japanese specifications.

On the Continent of Europe

Continental markets are slightly more active among domestic users, but the tonnage involved is not large. The Belgian strike continues and a settlement is not yet in sight. Belgian works outside the lockout area are well sold and delays in shipments are extending. The Belgian wire rod sales office has suspended bookings, as the works are sold out to the end of the year.

The German wire rope syndicate has collapsed,

owing to the refusal of three works to join. Gutehoffnungshütte (Oberhausen, Rheinland) is about to blow out one furnace. [The plant contains eleven blast furnaces.]

Heavy Iron and Steel Lines in Britain Hard Hit—Tin Plate Pool Looms

LONDON, ENGLAND, Oct. 1.—No change of importance has occurred in the iron and steel markets of this country during the past week or two and business continues restricted. In the galvanized sheet and black sheet trade considerable activity has been witnessed, British makers being, of course, more than able to hold their own against the Continental producers. But in semi-finished iron and steel, pig iron and heavy sections of manufactured iron and steel, Continental competition has continued prominent.

On the other hand, however, though the overseas business in these products has to a large extent passed into the hands of the foreigner, no great volume of business has been done, while home users of foreign products buy only sparingly. The natural inference is that prices are too high; at least, that is the opinion of users. But when it is remembered that British steel today is barely 30 per cent over the pre-war rate and foreign steel only 25 per cent over the lowest pre-war figure, it is difficult to see how lower prices are to be obtained as, both in this country and on the Continent, the standard of living is considerably higher, in proportion, than the selling price of steel.

British ship plates at about £8 (1.73c. per lb.) delivered are well in excess of the Continental price. But if coal and other costs were to come down substantially, it is hard to see that steel would be reduced in proportion, as the balance sheets of many iron and steel works reflect big losses and arrears of returns to shareholders. That the bottom is about reached, both here and on the Continent, now seems the prevailing feeling. In justification of this, the last few days

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.84 per £, as follows:

Durham, coke, del'd.	£0 18s.	\$4.36
Bilbao Rubio ore†	1 0½	4.96
Cleveland No. 1 fdy.	3 9½	16.82
Cleveland No. 3 fdy.	3 6½	16.09
Cleveland No. 4 fdy.	3 5½	15.85
Cleveland No. 4 forge	3 4½	15.61
Cleveland basic	3 7	16.21
East Coast mixed	3 14	17.91
East Coast hematite	4 19	23.96
Ferromanganese	15 10	75.02
*Ferromanganese	15 5	73.81
Rails, 60 lb. and up.	8 5	to £9 0s. 39.93 to \$43.56
Billets	6 5	to 7 15 30.25 to 37.51
Sheet and tin plate bars, Welsh	6 5	30.25
Tin plates, base box.	0 19½	to 0 19½ 4.69 to 4.78
C. per Lb.		
Ship plates	7 12½	to 8 2½ 1.65 to 1.75
Boiler plates	11 10	to 12 0 2.48 to 2.59
Tees	7 17½	to 8 7½ 1.70 to 1.81
Channels	7 2½	to 7 12½ 1.54 to 1.65
Beams	6 17½	to 7 7½ 1.49 to 1.60
Round bars, ¾ to 3 in.	8 7½	to 8 17½ 1.81 to 1.92
Steel hoops	10 15	and 12 10* 2.32 and 2.70*
Black sheets, 24 gage	11 5	2.43
Black sheets, Japanese specifications	15 5	3.30
Galv. sheets, 24 gage	16 5	3.51
Cold rolled steel strip, 20 gage	18 0	3.89

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

Foundry pig iron:(a)	£3 2s.	to £3 3s.	\$15.00 to \$15.24
Belgium	3 2	to 3 3	15.00 to 15.24
France	3 2	to 3 3	15.00 to 15.24
Luxemburg	3 2	to 3 3	15.00 to 15.24
Basic pig iron:(a)	3 1	to 3 2	14.76 to 15.00
Belgium	3 1	to 3 2	14.76 to 15.00
France	3 1	to 3 2	14.76 to 15.00
Luxemburg	3 1	to 3 2	14.76 to 15.00
Billets:	4 10½	to 4 11	21.90 to 22.03
Belgium	4 10½	to 4 11	21.90 to 22.03
France	4 10½	to 4 11	21.90 to 22.03
Merchant bars:	5 6	to 5 7	C. per Lb. 1.14 to 1.15
Belgium	5 6	to 5 7	1.14 to 1.15
Luxemburg	5 6	to 5 7	1.14 to 1.15
France	5 6	to 5 7	1.14 to 1.15
Joists (beams):	5 2	to 5 3	1.10 to 1.11
Belgium	5 2	to 5 3	1.10 to 1.11
Luxemburg	5 2	to 5 3	1.10 to 1.11
France	5 2	to 5 3	1.10 to 1.11
Angles:	5 2		1.10
Belgium	5 2		1.10
½-in. plates:	6 0		1.43
Belgium	6 0		1.43
Germany	6 0		1.43
¾-in. ship plates:	6 2½	to 6 5	1.32 to 1.35
Belgium	6 2½	to 6 5	1.32 to 1.35
Luxemburg	6 2½	to 6 5	1.32 to 1.35
Sheets, heavy:	6 14	to 6 15	1.45 to 1.46
Belgium	6 14	to 6 15	1.45 to 1.46
Germany	6 14	to 6 15	1.45 to 1.46

(a) Nominal.

have witnessed a moderate revival of demand, and pig iron producers are hoping that the tide has turned. The heavy steel trade reflects the poor state of shipbuilding and no real improvement can be expected until more vessels are put on the stocks.

Output Pooling for Tin Plate

Tin plate market developments of interest have occurred lately. Considerable dissension among makers has been ripe since the break of the Stabilization Scheme of prices. It now seems probable that a pooling scheme of output will be adopted, with a penalty of 2s. 6d. (60c.) a box for production over the datum line and a receipt of 1s. (24c.) a box for production under the given line.

This arrangement is expected to come into force in January, basing it on the average production of the six months, January to July, 1925. It is anticipated thereby that all works will receive their fair share of work. Meanwhile the uncertainties regarding this matter, and the question of using foreign steel in place of Welsh bars, has caused a good deal of uncertainty and buying has been restricted. Should the scheme devolve definitely, it is expected that prices will go up to about 20s. (\$4.84) basis and stabilize themselves around that figure.

GERMANS MARKING TIME

Iron and Steel Inactive Except in Automobile and Agricultural Branches

BERLIN, GERMANY, Sept. 30.—No improvement has taken place in the steel or coal trades. Hopes of future improvement concentrate exclusively upon plans for international agreements and for further fusions at home. The general trade situation has suffered a slight set-back. The percentage of manufacturers reporting good business has declined, while the number of unemployed has risen to 231,000 from a low point this year of 193,000.

As a result of good European crops, and of very good German crops, prices of necessary food products have fallen; and the new increased customs tariff has not so far raised the cost of living. The latest wholesale price index (Sept. 16) shows a rise of 25.3 per cent over 1913-14; the latest cost-of-living index (August average) shows a rise of 45 per cent. The average industrial wage for skilled workers in 11 industries, which in July was 43.32 marks (\$10.32 per week), shows a considerable rise since January, when the figure was 36.80 marks (\$8.77). In the steel industry in the same period the rise was from 35.50 marks (\$8.46) to 43.18 marks (\$10.33). As rents are being steadily put up, a further rise in cost of living and in wages is probable.

Markets Inactive

The pig iron market continues dull, and stocks of unsold material have accumulated, despite the all-around reduction in output. The position for semi-finished materials and rolled goods is similar. The bars market has been affected by the fact that many engineering firms, short of working capital, have sold their stocks. The same has been done to less extent with other sorts of iron and steel. The shipbuilding industry shows no recovery. The latest report shows the yards working at only 40 per cent of capacity.

The export market for sheets has improved, but production cost has risen rapidly, and foreign sales are reported at a loss. Of the finishing industries which consume sheets, only the canning branch is active. The Solingen cutlery branch continues to complain. Only moderate business was done at the recent Leipzig Fair, where high prices were the main obstacle. A few manufacturers who cut prices ruthlessly booked large sales. While the quantity of fine steel products exported of late has held well, the value shows a considerable falling off; and the average export price per given weight has declined by 10 per cent. After Great Britain, Brazil and British India are the two chief buy-

ers, the United States, Argentina and the Dutch Indies being a long way behind.

Agricultural Tools in Demand

The market for machine tools is unsatisfactory, owing to the cessation of buying by the heavy iron industry and by the railroad rolling-stock works. But large quantities of machine tools continue to be bought by automobile manufacturers, who have abundant orders. The demand for agricultural machinery and for machines used in the food industries is increasing, as a result of the good crops.

Conditions in the Siegerland smelting industry are bad. Of 29 blast furnaces, all but nine have been blown out. Industrial construction is inactive; and the increasing use of concrete construction is a permanent factor operating against the iron industry.

Prices have of late hardly changed; but in some branches, in particular bars, the official list prices are being privately undersold. Pig iron prices have moved, ex-works, as follows:

	Per Metric Ton		Per Gross Ton	
	July	Aug.-Sept.	July	Aug.-Sept.
Foundry iron No. 1..	93 m.	90 m.	\$22.51	\$21.78
Foundry iron No. 3..	91	88	22.02	21.30
Hematite	99½	95½	24.08	23.11
Siegerland steel-making iron	94	91	22.75	22.02
Spiegeleisen, 6 to 8 per cent Mn.	108	105	26.14	25.41
Ferromanganese, 80 per cent	295	295	71.39	71.39
Ferrosilicon, 10 per cent	128	124	30.98	30.01

Scrap iron is not being bought. Prices in countries which formerly delivered to Germany are higher than German prices, which are, per metric ton: Steel scrap, 53 to 54 m. (\$12.83 to \$13.07 per gross ton); solid scrap, 51 m. (\$12.34); turnings for Martin furnaces, 43 m. (\$10.40); blast furnace scrap, 41 m. (\$9.92). Prices of wares controlled by the Raw Steel Syndicate are, in marks per metric ton, with American equivalents:

	M.
Billets	120 or \$29.04
Slabs	125 30.25
Wire rods	140 33.88
Bars	135 or 1.46c. per lb.
Thick sheets (over 5 mm. or No. 6½ gage)	150 1.62c.
Medium sheets (3 to 5 mm.) ..	152 1.64c.
Thin sheets (1 to 3 mm. or No. 20 to No. 11½ gage)	165 1.78c.
Thin sheets (under 1 mm.)	180 1.95c.

Belgian Pig Iron, Steel and Iron Output

BRUSSELS, BELGIUM, Sept. 26.—Production of pig iron and steel in Belgium, in metric tons, has been as follows:

	Furnaces in Blast	Pig Iron	Steel Ingots
June, 1925	53	212,700	190,880
July, 1925	32	168,480	151,700
August, 1925	23	166,300	147,100
Monthly average, 1924 ..	46	234,000	231,622
Monthly average, 1913 ..	54	207,000	200,398
	Direct Castings	Finished Steel	Finished Iron
June, 1925	5,830	162,240	11,320
July, 1925	3,440	128,150	3,770
August, 1925	3,200	121,120	3,950
Monthly average, 1924 ..	6,755	198,216	16,729
Monthly average, 1913 ..	5,154	154,922	25,362

The fall in production during July and August results from the ironworkers' strike.

British Cutlery Industry Fears German and American Competition

WASHINGTON, Oct. 13.—Upon representation of British manufacturers of cutlery that they are unable to sell their products in the face of American and German competition, a committee has been appointed to pass on an application for protection under the Safeguarding of Industries act, says a cablegram received by the Department of Commerce. The products which are said to be chiefly in need of this protection are scissors, pens, and pocket knives.

Iron and Steel Markets

MORE GAINS IN ORDERS

A Week of Improvement, with Some Prices Tending Higher

Sheets a Leading Feature—Railroad Buying Increases—Activity in Steel Scrap

The week has brought a number of favorable developments in steel, and probably has been more marked in that respect than any week in months. Both the volume of new business and the indications of a high rate of operations for the remainder of the year have caused producers in a number of finished lines to take a firmer stand on prices. As in other like efforts to advance the market, considerable orders were entered, notably in sheets, at previous prices.

The Steel Corporation's unexpected gain of 204,000 tons in unfilled orders last month was the most definite measure the trade had had of the large volume of steel consumption and of the small margins of stocks on which manufacturing buyers had long been operating. Since the publication of the figures other steel producers have indicated that October new business has been running well ahead of shipments.

In steel works operations October has shown a further gain. While the September average was 77.5 per cent (counting ingot capacity at 54,000,000 tons a year), against 76 per cent in August, the Steel Corporation's rate is now above 80 per cent, with independent companies close to that figure.

While rail bookings, already 300,000 tons, the better outlook for railroad car buying, and a larger accumulation of orders for bars and sheets are the chief items in the week's improvement, nearly all departments of the market have been affected, including pig iron and steel scrap.

Independent sheet mills, in booking fully 300,000 tons last month, added about 50,000 tons to their unfilled orders, on the strength of which they have made advances of \$2 to \$3 a ton.

Makers of hot rolled strips quite generally have put up prices \$2 a ton. Another advance made by a majority of producers is \$1 on wire nails, restoring the basis of \$2.65 per keg. However, some sales within the week were at \$2.60.

With the past week's visitation of cold weather, the demand for coke for domestic use suddenly became a factor in the pig iron and furnace coke markets. Eastern dealers have bought quite heavily for stock, putting domestic coke at \$8 to \$8.50, while blast furnace coke has jumped to \$5 and \$6.

Concern over fuel costs has led some sellers of pig iron to refuse to quote for first quarter. A large radiator company has bought 16,000 tons at Chicago for that delivery, however, and 13,500 tons for its Detroit plant. Sanitary supply, radiator and automobile foundries are inquiring for a total of 50,000 tons.

Producers of alloy steel bars are announcing advances in view of the higher prices for nickel and other alloying metals. On the more common grades, the new prices are \$3 to \$5 per ton higher.

In the 300,000 tons of rails sold thus far for next year, 75,000 tons for the Illinois Central and 40,000 tons for the Missouri Pacific are among contracts just closed.

The Pennsylvania Railroad has ordered repairs to 6000 hopper cars, requiring 60,000 tons of steel. With close to 12,500 new cars pending, this reflects the greatest activity car builders have faced in months. The Missouri Pacific has inquired for 2200 cars, the Denver & Rio Grande Western for 750 and the Missouri-Kansas-Texas for 500, while 5000 are talked of for the Santa Fe and 1000 for the International-Great Northern.

With close to 40,000 tons awarded and more than 27,000 tons pending, the structural steel market continues its activity of recent weeks. Two awards exceeded 3000 tons each, but most of the work is in small tonnages.

Large buying of heavy melting steel scrap in the Pittsburgh and Youngstown districts reflects the improvement in steel works prospects. Three steel companies have closed for a total of 75,000 tons of heavy melting steel and sheet scrap at prices ranging from \$18.25 to \$19 for the former grade. Some further advance is probable.

Several noteworthy items have cropped up in iron and steel imports. More English iron is coming in, Pease & Partners, Ltd., having just sold 35,000 tons of Cleveland iron to an American buyer.

For a Reading railroad grain elevator 3500 tons of German reinforcing bars were bought at 1.97c., Philadelphia, duty paid. This was \$5 to \$7 a ton under domestic quotations, apart from one of 2.06c. delivered, on rerolled bars.

Foreign steel is increasingly becoming a factor on the Atlantic seaboard. A Central Western company is negotiating for a large tonnage of bars and small shapes, counting on the drawback it will get on its exported products. A Texas fabricator has bought 1500 tons of foreign shapes.

Pittsburgh

**Steel Market Stronger as Sheets Advance
—Coke Rises Sharply—Large Scrap Orders**

PITTSBURGH, Oct. 13.—It is easy for the steel trade here to take a cheerful view of things this week because all developments lately have been favorable to a stronger price situation, and it has been prices, rather than the volume of business, that have occasioned most dissatisfaction throughout the year. Business not only continues to maintain its recent expanding tendency, but in almost all lines incoming orders are running ahead of shipments and the mills are beginning to have fair-sized backlogs. Pipe makers are having some trouble in getting new orders equal to shipments, but at this time of the year there is usually a dropping off in the requirements of the oil and gas producers. The railroads are a little slow in speaking for their 1926 rail requirements and the rail mills at the moment are without backlog tonnages. This also is the case with track accessories, so far as local manufacturers are concerned, and few makers of plates are booked very

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 13, 1925	Oct. 6, 1925	Sept. 15, 1925	Oct. 14, 1924
No. 2X, Philadelphia...	\$22.26	\$22.26	\$21.76	\$21.76
No. 2, Valley furnace...	19.00	19.00	19.00	19.50
No. 2, Southern, Cin'ti...	23.05	23.05	23.05	21.55
No. 2, Birmingham, Ala...	19.00	19.00	18.50	17.50
No. 2 foundry, Ch'go furn...	21.50	21.50	21.00	20.50
Basic, del'd, eastern Pa...	21.00	21.00	20.50	20.00
Basic, Valley furnace...	18.50	18.50	18.50	19.00
Valley Bessemer del'd P'gh	21.26	21.26	21.26	21.76
Malleable, Chicago furn...	21.50	21.50	21.00	20.50
Malleable, Valley	19.00	19.00	19.00	19.50
Gray forge, Pittsburgh...	20.26	20.26	20.26	20.76
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.04
Ferromanganese, furnace...	115.00	115.00	115.00	95.00

Rails, Billets, etc., Per Gross Ton:

	Oct. 13, 1925	Oct. 6, 1925	Sept. 15, 1925	Oct. 14, 1924
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Beas. billets, Pittsburgh...	35.00	35.00	35.00	36.00
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	36.00
O.-h. sheet bars, P'gh...	35.00	35.00	35.00	37.00
Forging billets, base, P'gh	40.00	40.00	40.00	41.00
O.-h. billets, Phila...	39.30	40.30	40.30	41.17
Wire rods, Pittsburgh...	45.00	45.00	45.00	46.00
Skelp, gr. steel, P'gh, lb...	1.90	1.90	1.90	2.00
Light rails at mill...	1.65	1.65	1.65	1.85

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.32
Iron bars, Chicago...	1.90	1.90	1.90	2.10
Steel bars, Pittsburgh...	2.00	2.00	1.90	2.00
Steel bars, Chicago...	2.10	2.10	2.10	2.00
Steel bars, New York...	2.34	2.34	2.24	2.34
Tank plates, Pittsburgh...	1.80	1.80	1.80	1.80
Tank plates, Chicago...	2.10	2.10	2.10	2.00
Tank plates, New York...	2.04	2.04	2.09	1.94
Beams, Pittsburgh...	1.90	1.90	1.90	1.90
Beams, Chicago...	2.10	2.10	2.10	2.00
Beams, New York...	2.24	2.24	2.24	2.19
Steel hoops, Pittsburgh...	2.40	2.40	2.40	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Oct. 13, 1925	Oct. 6, 1925	Sept. 15, 1925	Oct. 14, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.10	3.10	3.15	3.50
Sheets, black, No. 28, Chi-				
cago dist. mill...	3.30	3.30	3.30	3.60
Sheets, galv., No. 28, P'gh	4.20	4.20	4.20	4.60
Sheets, galv., No. 28, Chi-				
cago dist. mill...	4.35	4.35	4.35	4.70
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.25	2.70
Sheets, blue, 9 & 10, Chi-				
cago dist. mill...	2.40	2.40	2.40	2.80
Wire nails, Pittsburgh...	2.60	2.60	2.65	2.75
Wire nails, Chicago dist.				
mill	2.70	2.70	2.70	2.85
Plain wire, Pittsburgh...	2.50	2.50	2.50	2.50
Plain wire, Chicago dist.				
mill	2.55	2.55	2.55	2.60
Barbed wire, galv., P'gh...	3.35	3.35	3.35	3.45
Barbed wire, galv., Chi-				
cago dist. mill...	3.40	3.40	3.40	3.55
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:

Carwheels, Chicago	\$17.00	\$17.00	\$17.50	\$18.00
Carwheels, Philadelphia ..	18.50	18.50	18.50	17.50
Heavy steel scrap, P'gh...	18.50	18.00	19.00	18.50
Heavy steel scrap, Phila...	16.50	16.50	17.50	16.50
Heavy steel scrap, Ch'go...	16.00	16.00	16.25	16.00
No. 1 cast, Pittsburgh...	17.00	17.00	17.50	18.00
No. 1 cast, Philadelphia...	18.00	18.00	18.00	17.50
No. 1 cast, Ch'go (net ton)	17.50	17.50	18.00	17.50
No. 1 RR. wrot. Phila...	18.00	18.00	17.50	18.50
No. 1 RR. wrot. Ch'go (net)	14.00	14.00	15.25	14.00

Coke, Connellsville,

Per Net Ton at Oven:

Furnace coke, prompt...	\$5.00	\$3.50	\$3.40	\$3.00
Foundry coke, prompt...	5.00	4.25	4.25	4.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.62½	14.50	15.00	13.25
Electrolytic copper, refinery	14.37½	14.12½	14.62½	13.00
Zinc, St. Louis...	8.20	8.05	7.75	6.30
Zinc, New York...	8.55	8.40	8.10	6.65
Lead, St. Louis...	9.25	9.25	9.25	7.82½
Lead, New York...	9.60	9.60	9.60	8.00
Tin (Stralts), New York...	62.12½	60.62½	58.50	50.25
Antimony (Asiatic), N. Y.	17.00	17.25	17.12½	11.00

THE IRON AGE Composite Prices

Oct. 13, 1925, Finished Steel, 2.403c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	One week ago, 2.403c. One month ago, 2.396c. One year ago, 2.460c. 10-year pre-war average, 1.689c.
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Oct. 13, 1925, Pig Iron, \$19.71 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	One week ago, \$19.71 One month ago, 19.46 One year ago, 19.46 10-year pre-war average, 15.72
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1923	High	1925	Low	1923
2.824c., April 24	2.789c., Jan. 15	2.560c., Jan. 6	2.396c., Aug. 18	2.446c., Jan. 2
\$30.86, March 20	\$22.88, Feb. 26	\$22.50, Jan. 13	\$18.96, July 7	\$20.77, Nov. 20

far ahead. But with inquiries for 12,000 railroad cars pending, there is strong hope for better engagement of plate mill capacity in the near future, and it is also likely that rail and accessory business soon will be flowing in.

In other directions longer mill schedules have been made possible by recent accretions to bookings, this being notably true in sheets and in steel bars. Independent sheet makers last month are estimated to have taken a total of 300,000 tons of new business and to have accumulated something like 50,000 tons of unfilled obligations. Unfilled orders at the end of September were equal to about two months' engagement

with operations at about 80 per cent, and bookings so far this month are running well ahead of the same period in September. The encouraging feature of these obligations is that they are entirely on orders, rather than contracts, because the orders call for deliveries whereas contracts might merely mean options for the buyer to exercise or not as conditions might dictate. What is true of unfilled sheet obligations in a large measure is true of other products, i. e., when the mills are behind in deliveries it is on live specifications.

With buying of steel continuing at an active rate, with order books growing stout and with no evidence of any curtailment in the activity of steel consuming

industries, it is not surprising that this week has seen the development of a stronger price stand by manufacturers. Advances amounting to from \$2 to \$3 a ton have been made by sheet makers on the common finishes and, in view of the fact that business in full-finished sheets is so heavy that delivery promises now are running from six to eight weeks on new business, a stiffening in the price of that grade is probable. Makers of hot-rolled strip generally are asking an advance of \$2 a ton and the recent weakness in wire nails has been followed by a restoration of the former price on that product. Meanwhile, steel bars are solid at 2c., base, Pittsburgh, and efforts continue to be made to raise shape and plate prices. The primary materials are lending aid to a stronger steel situation. Scrap prices have retrieved half of their recent decline on large purchases by Youngstown and Pittsburgh district mills. The fact that the first wave of cool weather brought no sign of a settlement of the anthracite strike has resulted in a wild rush of buying of coke that has sent prices up so sharply as to give some concern about fuel costs in the making of pig iron. The iron market is also firmer because of increased interest in supplies on the part of consumers.

Pig Iron.—This market is firmer and, although not higher, at least recent price irregularities have disappeared. There is not only a livelier interest in supplies on the part of melters, but also the factor of an excited coke market, which may mean a stiff advance on first quarter requirements as compared with the price now ruling on prompt shipments. Spot furnace coke has advanced as much as \$2 a ton in a week because of Eastern demands for coke for stocking against a possible shortage of domestic fuel. For several weeks Eastern buyers have been paying \$6 and even \$7 per ton at ovens for crushed coke in prepared sizes for domestic use. In the past two weeks they have been taking ordinary furnace grade with only such crushing as might occur in drawing coke by mechanical means, and today as much as \$6 was paid for regular furnace coke, the crushing to be done by the buyers. This affords producers a very profitable outlet for coke and so long as the demand lasts there will be little chance to get coke for metallurgical use at less. Furnaces now in blast in this district are being operated on cheaper coke. But looking ahead to the first quarter there is the danger that higher prices will rule, and this is reflected in the price ideas of pig iron producers. Some producers want \$19.50, Valley furnace, for No. 2 foundry for shipment over the remainder of the year, and are not disposed to name less than \$20 on first quarter business. On business in Ohio, Valley furnaces have obtained those prices, but locally \$19 still is the top of the market on this grade for shipment this year, and the local first quarter price should be determined in the next few days as the Standard Sanitary Mfg. Co. has appeared in the market for about 20,000 tons for that delivery to its local plants. The National Radiator Co. was able to buy 3000 tons of No. 2 foundry for its Newcastle, Pa., plant for shipment this year at \$19, Valley furnace, and the requirements of its Johnstown, Pa., plant, amounting to 4000 tons, for delivery by the end of this year, were placed with a nearby steel company at a price equivalent to \$19 at Valley furnaces. There were no furnaces between Johnstown and the Valley districts which had the iron to sell. Other foundry iron sales, though small, have reached a larger total in the past week than the week before. It is observed, however, that Valley furnaces are doing best away from than toward Pittsburgh, this being possible because Lake furnaces appear well sold, and prices are high enough at Cleveland, Toledo and Detroit to let Valley iron move west. No important sales of the steel-making grades are noted.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$18.50
Bessemer	19.50
Gray forge	\$18.50 to 19.00
No. 2 foundry	19.00 to 19.50
No. 3 foundry	18.50 to 19.00
Malleable	19.00 to 19.50
Low phosphorus, copper free....	27.50 to 28.00

Ferroalloys.—Fair demand is noted locally for small

tonnages of ferromanganese for early shipment, but consumers as yet are showing no interest in future requirements. Prices are firm at \$115, Atlantic seaboard, for 80 per cent domestic or foreign material. Some 75 per cent Indian ferromanganese is being offered for first quarter delivery at slightly above \$100, Atlantic seaboard, duty paid. This material runs rather high in phosphorus and because of that fact it is thought it will not find a ready market in this country despite its low price. Spiegeleisen is moving well on old orders, but there is not much new business. Sales of the higher grades of ferrosilicon are few and small. Prices are given on page 1079.

Alloy Steel Bars.—The leading local maker of alloy steel bars is asking higher prices on most grades of nickel steel bars. The advances are based on the stronger market in nickel primarily, but demand lately has been so good that all makers are well supplied with business, and competition is less sharp. The market is firmer in other alloy bars than it was recently. Prices are given on page 1079.

Semi-Finished Steel.—Mills in this district still disclaim making lower prices than \$35, Pittsburgh, on billets, slabs and sheet bars, but all three forms have been sold at \$33.50, Youngstown, which is equivalent to \$35.39, delivered Pittsburgh common rate points. It is probable that the price of local mills in many cases is on a delivered, not f. o. b. Pittsburgh basis, since \$35, f. o. b. Pittsburgh, would make delivered prices within the district \$35.63 to \$36.26. As little semi-finished steel is moving to non-integrated mills in the Pittsburgh district from Youngstown, it is patent that delivered price from local producers is less than from Youngstown mills. The market on forging billets still appears to be \$40, Pittsburgh. Wire rods are slow, but prices are holding fairly well. There is no activity in skelp. Prices are given on page 1079.

Wire Products.—The market is showing a stronger front in nails, which recently were subject to considerable price cutting and were not selling above \$2.60, base, per keg, Pittsburgh, except within the immediate Pittsburgh district. Several makers who were taking business at that price to protect their regular customers, have announced a reestablishment of \$2.65 base, since a week ago, and this price now appears to be the minimum going quotation. Prices of other products have held well, except for freight equalizations necessary to enable local mills to reach certain consuming territories. Business still shows a tendency to expand and the improvement now embraces nails, which seemingly needed the stimulation of price concessions to move well. None of the mills has a backlog of any considerable size, but the constancy of demand is an equally good factor in sustaining a fairly high rate of mill operations. Prices are given on page 1078.

Rails and Track Supplies.—Railroads which ordinarily depend upon Pittsburgh for standard rails are yet to place their 1926 requirements, but the hope is strong that they will do so before long. Current business in fastenings also is light, but with the placing of rail business, the roads are expected to order accessories in good volume. Light rails are selling fairly well, but demand still lacks snap. Prices show no change; they are given on page 1078.

Tubular Goods.—A good demand is still reported for standard pipe, but there is a steady tapering off in orders for oil country pipe and only small tonnages of line pipe are coming out. Total bookings are somewhat behind shipments and what there is in the way of backlogs, mostly in line pipe, is largely disposed of. Pipe making capacity is engaged to the extent of 75 and 80 per cent, this being a slight decrease as compared with a month ago. This is a seasonal development, since there is not, taking the country as a whole, as much drilling for oil and gas in the winter as in other seasons. There is nothing new as to prices, except that the secondary market is firmer than it has been over most of the year. Boiler tubes are not moving in volume and prices are weak in the scramble of makers to secure orders. Discounts are given on page 1078.

Sheets.—A sequel to the recent low prices on the ordinary finishes of sheets is found in the fact that manufacturers now have rather good-sized order books and are disposed to take a firmer stand on prices. Several makers since a week ago have announced prices of 3.15c., base, Pittsburgh, for black; 2.30c., base, for blue annealed and 4.30c. base for galvanized. Some mills have quoted these prices for some time, but actually, on black sheets, 3.10c. has been the real maximum, with some business being taken as low as 3c., while on blue annealed and galvanized, the real sales price has been \$2 a ton below the quotations. One maker in this price adjustment has gone to 3.25c., base, for black; 2.40c., base, for blue annealed, and 4.40c., base, for galvanized. The new prices have not yet been seriously tested, but makers appear serious about getting higher prices, maintaining that even the new quotations do not show a fair profit. So far, the price of automobile body sheets has not been disturbed although there is a genuinely good demand for this grade, and so far as order books are concerned, makers are better off than they are in other finishes. Deliveries are becoming more extended, with some mills now promising six and seven weeks on new business. Mill operations still average about 80 per cent of capacity. Prices are given on page 1078.

Tin Plate.—Business, although lighter than during the summer, is good for this time of year, the usual seasonal decline in demand having been smaller than usual. The steady advance in pig tin has aroused interest in the price of tin plate for the first quarter and first half of next year. At about 62c. per lb., pig tin is 20c. per lb. higher than it was when the present price of tin plate was established on April 26, 1923. This means, on a basis of 1.65 lb. of tin per box, that the cost of a box has been increased 33c., or \$6.60 per net ton. But a comparison between today's price of sheet bars and those of early 1923 reveals a drop of about \$7.50 per gross ton, while labor costs, which are governed by the sheet mill bi-monthly settlements, are much lower, the base gage for black sheets now being 3.15c., against 3.50c. two and a half years ago. Continuance of the present price on tin plate is therefore expected.

Cold-Finished Steel Bars and Shafting.—The automobile industry is busy and is demanding considerable steel, which it wants promptly. On ordinary tonnages the market is firm at 2.40c., base, Pittsburgh.

Steel and Iron Bars.—The leading maker of steel in this district has a heavy order book and on some of the popular sizes of screw stock bars it is as much as seven and eight weeks behind on deliveries. The independent companies also are well provided with business and there is no longer any doubt that 2c. represents the Pittsburgh mill price. Iron bars are steady but not very active. Prices are given on page 1078.

Structural Steel.—A strong effort is still being made by the mills to establish 2c., Pittsburgh, as the minimum price on large structural shapes, but complete success has not yet attended the effort. Mills, however, are picking their business and it takes more attractive orders to bring out a lower price than was true recently. Structural shops in this district are fairly well supplied with business for early delivery and are losing jobs because they cannot make shipment as promptly as desired. They all could take business for delivery after Jan. 1, however. Plain material prices are given on page 1078.

Plates.—All makers regard present prices as too low, but there is not enough business to give all a fair share. The chief hope of better business and higher prices is in railroad buying. The Pennsylvania Railroad has placed 6000 cars for repairs. A good deal of the steel will come to Pittsburgh mills. The prevailing price on plates in this market is 1.80c. base. Prices are given on page 1078.

Hot Rolled Flats.—Some makers have advanced prices \$2 a ton since a week ago and now are quoting narrow material at 2.50c., and stock 6 in. and wider 2.30c., base, Pittsburgh. These prices are not fully established because one or two makers have not made the change and a good many buyers were allowed to

cover their early needs before this change. Prices are given on page 1078.

Cold Rolled Strips.—The market here is very firm at 3.75c., base, Pittsburgh, and it is thought likely that as the advance in hot rolled strips becomes effective, efforts will be made to get more money for the cold rolled product. There is a steady demand for cold rolled strips, particularly from the automotive industry.

Bolts, Nuts and Rivets.—There is a gradual expansion in bolt and nut orders, and while all makers could handle more business, there is no disposition to reach out for them at the expense of prices. The rivet market still is weak because the demand is not heavy enough to bring about a firmer stand. Prices are below costs with almost all makers. Discounts and prices are given on page 1079.

Coke and Coal.—Coke prices have taken a steep advance. Eastern jobbers and brokers, seeing little possibility of an early settlement of the anthracite coal strike, have been buying Connellsville coke heavily for the purpose of stocking it against possible shortage of fuel this winter and have been bidding up prices. They have paid \$6 per net ton at ovens for the ordinary run of furnace coke and the price of that grade and also of foundry coke no longer is influenced solely by metallurgical demands. With coke so greatly in demand for domestic use, producers do not have to depend on the blast furnace and foundry demand for a market. Independent Connellsville district operators are anxious to escape the necessity of raising wages to the scale paid by the H. C. Frick Coke Corporation and for that reason are moving slowly about putting on additional coking capacity in the fear that this would give the men an impression that higher wages could be had for the asking. Foundry coke has gone up not so much because of foundry demand, but because producers are running strongly to 48-hr. coke to supply the Eastern domestic demand. Coking coal is stiffer in sympathy with coke but other grades still are plentiful. Prices are on page 1079.

Old Material.—The market has developed more strength and activity since a week ago, more especially on the steel works grades. The Republic Iron & Steel Co. and the Youngstown Sheet & Tube Co. have made good-sized purchases, the former being credited with taking 10,000 tons and the latter with 40,000 tons of heavy melting steel and sheet scrap. Prices range from \$18.25 to \$19 for steel and from \$16.50 to \$17 for the sheet scrap. The Weirton Steel Co. today closed for a large tonnage, paying \$18.50 for heavy melting steel, \$17.50 for compressed sheets and \$16.50 for bundled sheets. With a considerable demand also existing for scrap in the Canton, Ohio, district and with Pittsburgh unable to secure much scrap in competition with Eastern mills, the supply situation has grown decidedly tight and prices here seem likely to go still higher in the event that demand comes from mills not now in the market. The Norfolk & Western October list has 3708 gross tons and the Baltimore & Ohio list 16,260 gross tons.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel.....	\$18.50
No. 1 cast, cupola size.....	\$17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	20.00 to 20.50
Compressed sheet steel.....	17.50
Bundled sheets, sides and ends..	16.50
Railroad knuckles and couplers..	20.50 to 21.00
Railroad coil and leaf springs..	20.50 to 21.00
Low phosphorus blooms and billet ends	23.00 to 23.50
Low phosphorus plate and other material	21.50 to 22.00
Low phosphorus punchings	20.00 to 20.50
Railroad malleable	18.50 to 19.00
Steel car axles	20.50 to 21.00
Cast iron wheels	17.00 to 17.50
Roller steel wheels	20.50 to 21.00
Machine shop turnings	14.00 to 14.50
Short shoveling turnings	14.00 to 14.50
Sheet bar crops	19.00 to 19.50
Heavy steel axle turnings	16.50 to 17.00
Short mixed borings and turnings ..	13.50 to 14.00
Heavy breakable cast.....	15.50 to 16.00
Stove plate	13.50 to 14.00
Cast iron borings	14.00 to 14.50
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	18.50

Chicago

Cars Pending Total 10,000—Rail Orders for 300,000 Tons Placed

CHICAGO, Oct. 13.—Inquiries for finished steel products during the past week were greater than for any corresponding period so far this year. This is largely attributed to the fact that railroads are now contracting for their rail requirements for delivery next year. All told, 500,000 tons of rails have been inquired for throughout the country, and 300,000 of these have been placed. Track fastenings, including tie plates, are going with the rails. The Illinois Central has distributed 75,000 tons of rails as follows: 18,500 tons to the Inland Steel Co., 30,000 tons to the Illinois Steel Co., and 26,500 tons to the Tennessee Coal, Iron & Railroad Co. Ten thousand tons of track fastenings have not yet been placed. Estimates by steel producers indicate that 110,000 tons of plates, shapes and bars will be required for 10,000 cars which are now being figured on by Western car manufacturers. Of these cars 8500 are for Western railroads.

It is now announced 4000 tons of steel required for the Carquinez Straits Bridge, San Francisco, Cal., will be fabricated at the Gary shops of the American Bridge Co., and that the steel will be rolled by the Steel Corporation in its Chicago district mills. Structural awards for the week were in good volume, five of the largest contracts requiring about 10,000 tons of plates, shapes and bars. An addition to the power plant of the Public Service Co., of Northern Illinois, Waukegan, Ill., 3850 tons, was awarded to the American Bridge Co.

Ingot production is unchanged with mills operating at or near the 80 per cent mark. The Wisconsin Steel Co. has blown in its third stack, which has been out for repairs for about two months. This increases the number of active steel works furnaces to 24 out of 35 in the district.

The No. 4 Iroquois stack, blown in this week, is the second merchant furnace to be lighted within a month. Active merchant stacks in this district now include three Iroquois, two Federal, one Mayville, the Zenith furnace and the Thomas stack.

Pig Iron.—Buying is more liberal and specifications against contracts are coming in more freely than a week ago. Furnace stocks are reported low and there are indications that melters generally are working with less than a 30 days' supply of iron. Deliveries are tightening and users in many instances are in need of more iron than their contracts call for. Delivery on contract for any given month means that the seller can ship the specified tonnage at any time during the month; thus it is apparent that users find it a measure of safety to carry a stock which will at least carry them over a 30-day period. A local melter is inquiring for 2000 tons of malleable for first quarter delivery to Chicago and Indiana foundries. Two other first quarter inquiries are 500 tons of malleable for a Michigan user and 1000 tons of malleable for an Illinois melter. An inquiry for 14,000 tons of foundry and malleable iron, for delivery during the remainder of the year, has been issued by an Eastern Michigan plant.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$21.50
Northern No. 1 foundry, sil. 2.25 to 2.75	22.00
Malleable, not over 2.25 sil.	21.50
High phosphorus	21.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	\$25.51 to 26.01
Southern No. 2 (barge and rail)	23.68
Low phos., sil. 1 to 2 per cent, copper free	31.10 to 31.60
Silvery, sil. 8 per cent.	32.29
Ferrosilicon, 14 to 16 per cent.	45.25 to 45.75

Plates.—One hundred twenty thousand tons of plates, shapes and bars will be required for 10,000 cars which are being actively bid on by Western car

manufacturers. The number of cars being inquired for by purely Western railroads, is now in the neighborhood of 8500. It is reported that the Missouri Pacific has authorized the purchase of 2000 box, stock, automobile and coal cars and 1,000 box and automobile cars for the International Great Northern. The Denver & Rio Grande Western has definitely entered the market for 750 cars of various types. The Missouri-Kansas-Texas will take bids on 50 box cars and the Kansas City, Mexico & Orient is making inquiry for 400 box cars. Other active inquiries are those of the Frisco lines and the Atlantic Coast Line. Of the 1600 cars placed last week, 275 were contracted for with the American Car & Foundry Co. by the Cuban Railways and 200 flat cars were awarded to the Standard Steel Car Co. by the Illinois Central Railroad. No disposition has as yet been made by the Illinois Central of its inquiry for stock cars. Two thousand tons of tank steel will be required for oil storage tanks recently placed with the Graver Corporation by the Roxana Petroleum Corporation. One order for tank steel placed during the week calls for 1500 tons. Mill prices are unchanged at 2.10c., Chicago.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Bars.—Inquiry for soft steel bars is well maintained and it is noticeable that the demand for this commodity has increased. Bolt and nut manufacturers are specifying more heavily and the same is true of fence post makers who, last week, took 2500 tons of soft steel bars from a local mill. There is no change in the delivery situation and the price is steady at 2.10c., Chicago. Mill operations on rail steel bars remain the same and the price is still steady at 2c., Chicago. Iron bar mill operations are slightly improved and inquiries received during the week indicate a more active interest in this commodity. The price of iron bars is unchanged at 1.92c. to 2c., Chicago.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 1.90c. to 2c., Chicago; rail steel bars, 2c., Chicago, and 2c., mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Wire Products.—A tendency is being shown for the prices of wire products to become more firm and concessions are disappearing. Insistence for prompt delivery by both jobbers and manufacturers indicates that they have made little or no effort to build up stocks. Mill operations are unchanged and are reported as being slightly under 65 per cent. Mill prices, which are unchanged, are shown on page 1078.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.05 per 100 lb.; common wire nails, 3.15 per keg; cement coated nails, \$2.15 to \$2.20.

Rails and Track Supplies.—Up to date, rail inquiry made throughout the country has totaled 500,000 tons. Of this amount approximately 300,000 tons have been placed and it is expected by the trade that the remaining 200,000 tons will be contracted for within the next few days. These estimates are based on rail tonnages to be delivered next year. Track fastenings are being taken with the rails, thus indicating that a total of 75,000 tons of bolts, spikes, angle bars and tie plates have been inquired for and that 50,000 tons have been purchased. Purchases made during the week included 40,000 tons of rails for the Union Pacific and 40,000 tons for the Northern Pacific. Railroads which it is expected will be actively in the market within a short time are the Chicago, Milwaukee & St. Paul and the Santa Fe. No change has taken place in the prices of rails and track supplies within the Chicago territory.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c. mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.25c. to 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.55c. base.

Sheets.—A local producer reports that the volume of sheet business during the first half of October was in excess of that for any corresponding period since November of last year. Sixty per cent of the tonnage placed is said to consist of spot orders.

Chicago delivered prices from mill 3.30c. to 3.40c. for No. 28 black, 2.45c. to 2.50c. for No. 10 blue annealed and 4.40c. to 4.45c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4c. base for black, and 5c. base for galvanized.

Structural Material.—Mill bookings for plain material have been well maintained during the week and prices remain steady at 2.10c., Chicago. Five structural awards placed during the week totaled approximately 10,000 tons and smaller contracts reached a total of about 4000 tons. Among the outstanding contracts were:

Addition to the power plant of the Public Service Company of Northern Illinois, 3850 tons to the American Bridge Co.

Addition to the Standard Oil Co. building, Michigan Avenue, Chicago, 1900 tons to the American Bridge Co.

Factory building for the A. O. Smith Corporation, Milwaukee, 1500 tons and also 1500 tons of bridge work for the Great Northern Railroad to the Milwaukee Bridge Co.

Fabricators expect that the Lake Shore Athletic Club Contract, requiring 3500 tons, will be let this week. It is now reported that the Carquinez Straits bridge, near San Francisco, will be fabricated at Gary. This contract was awarded some time ago to the American Bridge Co. and will require about 14,000 tons of steel which, it is now announced, will be rolled at the local mills of the steel corporation.

The mill quotation on plain material is 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bolts, Nuts and Rivets.—Specifications are now being received in good volume on contracts recently placed for the fourth quarter. It is generally estimated that contracting for the fourth quarter is about 80 per cent completed. The market is stable and makers, operating at slightly better than 70 per cent, are meeting delivery schedules.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to $\frac{3}{4}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{3}{4}$ x 4 in., 50 off; larger sizes, 50 off; hot-pressed nuts, squares, tapped or blank, \$3.50 off; hot-pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Cast Iron Pipe.—Few large specifications are out for cast iron pipe, the bulk of the business coming from a great number of small private users and small municipalities. The volume of both inquiry and bookings is well maintained and foundries have not diminished their rate of operations. The tendency is for deliveries to be still further extended and one producer announces a gain of two weeks' orders during the past seven days. Litchfield, Ill., divided an award of 700 tons of 6-in. and 10-in. Class B pipe between the American Cast Iron Pipe & Foundry Co. and the National Cast Iron Pipe Co. at a stated price of \$41.75, delivered. Roachdale, Ind., awarded 200 tons of 8-in., 40 tons of 6-in. and 105 tons of 4-in., Class B, pipe to the American Cast Iron Pipe & Foundry Co. The Glamorgan Pipe & Foundry Co. received a contract from Saginaw, Mich., for 350 tons of 6-in., 8-in. and 12-in., Class B, pipe. Mattoon, Ill., placed 250 tons 12-in., Class B pipe with the National Cast Iron Pipe Co., Connersville, Ind., will receive bids on 300 tons of 6-in., Class B, pipe.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$53.20 to \$54.20; 6-in. and over, \$49.20 to \$50.20; Class A and gas pipe, \$4 extra.

Reinforcing Bars.—Reinforcing bar lettings are still in good volume, although the bulk of the business placed during the week was made up of small tonnages. Inquiries continue to come in at a surprisingly high rate for this time of the year and the trade expects good business to extend at least into the early winter. Bending shops are reported to be operating full. Warehouse prices on billet steel reinforcing bars remain at 2.60c., Chicago. Lettings include:

Wrigley Garage, State and Kinzie Streets, Chicago, 360 tons to the Barton Spiderweb System, Inc.

Krueger School, Board of Education, 650 South Clark Street, Chicago, 174 tons of rail steel to the Inland Steel Co. Commonwealth Edison Co., second section of switch house, Crawford Avenue, Chicago, 100 tons to Jones & Laughlin Steel Corporation.

Y. M. C. A. building, Irving Park, Chicago, 164 tons to Concrete Engineering Co.

Y. M. C. A. building, Roseland, Ill., 164 tons to Concrete Engineering Co.

Palmer Laundry, Thirty-fourth Place and Rhoades Street, Chicago, 150 tons of rail steel to Inland Steel Co.

Minnesota Cooperative Creamery Association building, Minneapolis, Minn., 300 tons to A. P. Husted Co.

Pending work includes:

Elementary public school, Fifty-eighth and Springfield Streets, Chicago, 150 tons. General contract awarded to Vincent D. Still.

Central Cold Storage Warehouse Co. building, Peoria, Ill., 200 tons. General contract awarded to Valentine Jobst.

Addition to high school gymnasium, Waukegan, Ill., 200 tons. General contractor, John Soller & Son, Davenport, Iowa.

Eighteen-story hotel, 180 East Delaware Place, Chicago, 100 tons. Architect, Leo Steff.

Six-story apartment building, 4826 Sheridan Road, Chicago, 100 tons. David Soli Klasper, architect.

Mercantile building, State and Kinzie Streets, Chicago, for Judson F. Stone and William O. Neicher, 100 tons. Holabird & Roche, Chicago, architects.

Seventeen-story cooperative apartment building for Albert Swaine, Fifty-eighth Street and Stony Island Avenue, Chicago, 900 tons. Frederick Olsen, architect.

Cold Rolled Strip.—Mill operations on cold rolled strip are said to be at about 100 per cent. Both contracts and specific orders are in good volume and deliveries have been slightly extended. Prices remain steady at 4.05c. per lb. base, delivered Chicago.

Coke.—Foundry coke contracting for the fourth quarter has progressed rapidly and some interest is being shown in first quarter requirements. Spot buying is in good volume and deliveries to date are satisfactory to consumers. Foundry coke is firm at \$10.75, delivered in the Chicago switching district.

Old Material.—The scrap market has finally found a footing and prices during the week have remained unchanged. Buying in any great volume has not made its appearance, although it is active enough to absorb readily that tonnage which is appearing on track. Several large users took 5000 tons of heavy melting steel at \$16.25 per gross ton. One roller of old rails contracted for a fair tonnage at \$18.50 per gross ton. Buying of cast scrap by foundries is in fair volume, although in small lots. Railroad lists include: Baltimore & Ohio, 16,000 tons; Chesapeake & Ohio, 11,000 tons; Northern Pacific, 2200 tons; Duluth, South Shore & Atlantic, 300 tons; Grand Trunk, 1000 tons and the Soo Line, 300 tons. Crane Co. is offering 750 tons of malleable iron borings.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid as follows:

Per Gross Ton	
Iron rails	\$18.00 to \$18.50
Cast iron car wheels	17.00 to 17.50
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	19.00 to 19.50
Railroad tires, charging box size	19.00 to 19.50
Railroad leaf springs, cut apart	19.00 to 19.50
Rails for rolling	18.50 to 19.00
Steel rails, less than 3 ft.	19.50 to 20.00
Heavy melting steel	16.00 to 16.25
Frogs, switches and guards, cut apart	17.50 to 18.00
Shoveling steel	15.75 to 16.00
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	13.75 to 14.25
Axle turnings	13.50 to 14.00
Steel angle bars	18.50 to 19.00
Steel knuckles and couplers	18.50 to 19.00
Coil springs	19.50 to 20.00
Low phos. punchings	18.00 to 18.50
Machine shop turnings	9.50 to 10.00
Cast borings	12.75 to 13.25
Short shoveling turnings	12.75 to 13.25
Railroad malleable	18.50 to 19.00
Agricultural malleable	18.00 to 18.50

Per Net Ton	
Iron angle and splice bars	18.25 to 18.75
Iron arch bars and transoms	20.75 to 21.25
Iron car axles	26.50 to 27.00
Steel car axles	17.50 to 18.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	9.00 to 9.50
Pipes and flues	11.00 to 11.50
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	14.25 to 14.50
No. 1 machinery cast	17.25 to 17.75
No. 1 railroad cast	16.75 to 17.25
No. 1 agricultural cast	16.50 to 17.00
Locomotive tires, smooth	16.50 to 17.00
Stove plate	14.50 to 15.00
Grate bars	14.25 to 14.75
Brake shoes	14.00 to 14.50

Boston

Pig Iron Buying Still on Small Scale—Scrap Prices Easier

BOSTON, Oct. 13.—Pig iron buying shows little or no increase. Some furnace representatives speak of improvement in business, but it is slight. In the absence of aggressive buying, prices appear firmer. Current sales of Buffalo district iron are on a basis of \$19.50, furnace, for No. 2 plain and \$20 for No. 2X. Buyers maintain they have bought No. 2X during the past few days at \$19.50, however. New York State iron is selling at \$19.50, furnace, for No. 2 plain, with the delivered price under that on Buffalo iron owing to lower freight rates. Moderate tonnages of western Pennsylvania iron were placed in Connecticut the past week on a basis of \$24.91, delivered, for No. 2 plain for first quarter shipment, and at 50c. a ton less for 1925 shipment. Alabama iron is still selling on a basis of \$28.60 to \$29.10, delivered, for No. 2 plain, but it is intimated prices will be advanced shortly owing to the sold up condition of furnaces. Foreign iron continues a factor in this market, although tonnages offered are not large. Continental iron is still available at \$21.50 a ton on dock Boston, duty paid. Reports from western Massachusetts are that foundries are increasing their melt. Foundry activities in the eastern part of the State, in Maine, New Hampshire and Vermont show no increase.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$24.65
East. Penn., sil. 2.25 to 2.75.....	25.15
Buffalo, sil. 1.75 to 2.25.....	\$23.41 to 24.41
Buffalo, sil. 2.25 to 2.75.....	23.41 to 24.91
Virginia, sil. 1.75 to 2.25.....	28.92 to 29.42
Virginia, sil. 2.25 to 2.75.....	29.42 to 29.92
Alabama, sil. 1.75 to 2.25.....	28.60 to 29.10
Alabama, sil. 2.25 to 2.75.....	29.10 to 29.60

Shapes and Plates.—Lettings of steel for fabricated jobs were few the past week and mostly for lots of less than 100 tons. There is, however, a considerable tonnage being figured, some of which will not be made public until let, owing to the limited number of companies asked to bid. Large steel mills are holding shapes at 1.90c. base Pittsburgh, on round tonnages, and at 2c. on small lots. It is intimated by small mills that 1.85c. can be done on sizable tonnages. The market for plates is reported as barely steady at 1.75c. Pittsburgh base.

Finished Steel.—Warehouse quotations on cold rolled steel indicate keen competition for business. Early in the past week the general asking price on rounds dropped from \$4.15 per 100 lb. to \$3.95, and on squares, hexagons and flats from \$4.65 to \$4.45. During the past few days hexagons have been sold at \$3.95, representing a drop of 70c. per 100 lb. Quotations on other finished steel products and on iron show little variation.

Warehouse prices on finished steel follow:

Steel.—Soft bars, \$3.265 per 100 lb.; flats, \$4.15; plain concrete bars, \$3.265; deformed concrete bars, \$3.265 to \$3.54; angles under 3-in., \$3.265; tees and zees, \$3.415; structurals, angles and beams, \$3.365; plates, 1/4-in. and heavier, \$3.365; 1/2-in., \$3.565; tire steel, \$4.50 to \$4.75; open-hearth spring steel, \$5 to \$10; crucible spring steel, \$12; bands, \$4.015 to \$5; hoop steel, \$5.50 to \$6; cold rolled, rounds and hexagons, \$3.95; squares and flats, \$4.45; toe calk steel, \$6.

Iron.—Refined bars, \$3.265 per 100 lb.; best refined, \$4.60; Wayne, \$5.50; Norway, rounds, \$6.60; squares and flats, \$7.10.

Coke.—Although the movement of foundry coke from ovens to consumers so far this month is in excess of that for the corresponding time in September, interest in the coke market centers largely in domestic sizes. The largest producer in this market is practically sold out on nut, and has sufficient orders on its books for other sizes to take care of output the next three or four weeks. Because of the inability of New England ovens to make prompt deliveries on domestic fuel in certain New England districts, the demand for Connellsville fuel continues comparatively active, with prices still 50c. to \$1 a ton delivered lower than on local

fuel. Foundry coke is unchanged at \$12 a ton delivered, where the freight rate does not exceed \$3.10 a ton.

Old Material.—Buying of old material has dropped off appreciably, and the market, in general, is easier. Local firms which heretofore paid \$12 on cars for heavy melting steel have dropped their price to \$11.50, and have made a similar reduction in bids for such material as turnings and borings. The weakness here is attributed more to rejections of shipments to the Pittsburgh district than to local developments. Buying by eastern Pennsylvania mills has not been sufficiently heavy to offset the Pittsburgh situation. The supply of most kinds of scrap in New England is comparatively small; consequently the reduction in prices has created more or less of a deadlock between buyers and sellers.

The following prices are for gross ton lots delivered consuming points:

Textile cast	\$20.00 to \$21.00
No. 1 machinery cast.....	19.00 to 19.50
No. 2 machinery cast.....	15.50 to 16.50
Stove plates	13.50 to 14.50
Railroad malleable	19.00 to 19.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$11.50 to \$12.00
No. 1 railroad wrought.....	12.50 to 13.00
No. 1 yard wrought.....	11.50 to 12.00
Wrought pipe (1 in. in diameter, over 2 ft. long).....	11.50 to 12.00
Machine shop turnings.....	8.50 to 9.00
Cast iron borings, chemical.....	11.00 to 11.50
Cast iron borings, rolling mill.....	8.50 to 9.00
Blast furnace borings and turnings	8.50 to 9.00
Forged scrap	9.00 to 9.50
Bundled skeleton, long.....	9.00 to 9.50
Forged flashings	9.00 to 9.50
Bundled cotton ties, long.....	8.50 to 9.00
Bundled cotton ties, short.....	9.00 to 9.50
Shaftings	18.00 to 18.50
Street car axles.....	18.00 to 18.50
Rails for rerolling.....	12.50 to 13.00
Scrap rails	11.50 to 12.00

Buffalo

Pig Iron Buying Moderate—Wire Mills Active—Scrap Higher

BUFFALO, Oct. 12.—Pig iron inquiry for the week is about 10,000 tons, with bookings less than last week. Two inquiries, for 1000 tons each of foundry iron, are the only lots of size. A good deal of quiet negotiating of iron and resulting sales is reported, which do not appear officially as inquiry, so that pig iron business is probably a little better than shows on the surface. A local furnace, which had announced itself out of the market for the balance of the year, finds that it can accept a little for November and December shipment.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$19.00
No. 2X foundry, sil. 2.25 to 2.75.....	\$19.00 to 19.50
No. 1 foundry, sil. 2.75 to 3.25.....	19.50 to 20.00
Malleable, sil. up to 2.25.....	19.00
Basic	18.50
Lake Superior charcoal.....	29.28

Finished Iron and Steel.—Bar inquiry is good and firm at 2.265c., delivered Buffalo. Reinforcing bar business is lighter, but still fairly satisfactory. Current lettings including 100 tons for an addition to the steam plant of the Buffalo General Electric Co., and a 100-ton mill for the Louisville Cement Co., at Akron, N. Y. Sheet prices are firm at 3.465c. for black and 4.565c. for galvanized. Wire mills report good business and 80 per cent of capacity in operation. Warehouse business is much improved, the early part of October, being as good as any similar period since the spring.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 3.80c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.45c.; cold rolled shapes, 4.40c.; cold rolled rounds, 3.95c.; wire nails, 4c.; black wire, 4.05c.

Old Material.—No buying of tonnage has taken place over the past week, but the market appears stronger. One mill has made some purchases of machine shop turnings at \$12.50 to \$13 and some cast

iron borings have been bought at \$13.50. The outside market has developed strength and dealers are looking for buying during the current week. The heavy melting steel market is strong at \$18.50 to \$19, with no large stocks in dealers' yards. Dealers have had little opportunity to replenish their stocks, because of the high price at which material has been held for several weeks. Mills have been buying hand to mouth, rarely more than 30 to 45 days ahead of consumption. With an improvement in the finished steel market, it is probable that greater mill operation here will begin shortly.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel.....	\$18.50 to \$19.00
Low phosphorus.....	20.00 to 20.50
No. 1 railroad wrought.....	16.50 to 17.00
Car wheels.....	16.50 to 17.50
Machine shop turnings.....	12.75 to 13.25
Cast iron borings.....	13.00 to 13.50
No. 1 busheling.....	16.50 to 17.00
Stove plate.....	15.00
Grate bars.....	14.50 to 15.00
Hand bundled sheets.....	13.00 to 13.50
Hydraulic compressed.....	16.50 to 17.50
No. 1 machinery cast.....	16.50 to 17.00
Railroad malleable.....	19.50 to 20.00
No. 1 cast scrap.....	17.00 to 17.50
Iron axles.....	26.00 to 27.00
Steel axles.....	20.00 to 20.50

St. Louis

Missouri Pacific Buys 40,000 Tons of 85- and 90-lb. Rails—Scrap Market Weak

ST. LOUIS, Oct. 12.—Further strengthening of the pig iron market is reported this week. The melt in the district is increasing, as evidenced by the insistence with which consumers ask for shipments ahead of schedules. Also, there is an improvement in buying, although no heavy purchases are being made. Commitments of the St. Louis Coke & Iron Co. have placed them virtually out of the market for the remainder of the year, and other makers are in a strong position. A Southern maker sold 800 tons during the week, 300 tons of which brought \$21, Birmingham. Another Alabama furnace is quoting \$19 to \$20, and a Tennessee maker is quoting \$18.50 to \$19, Birmingham. Northern iron is being sold at \$21.50, Chicago, while the Granite City maker is quoting \$22.50 to \$23, Granite City, which is nominal. Pending inquiries total about 1000 tons.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25...	\$23.66
Northern malleable, sil. 1.75 to 2.25.....	23.66
Basic.....	23.66
Southern fdy., sil. 1.75 to 2.25...	\$24.17 to 25.17
Granite City iron, sil. 1.75 to 2.25.	23.31 to 23.81

Finished Iron and Steel.—The rail order of the Missouri Pacific Railroad, pending for several months, was placed during the week. For 40,000 tons of 85- and 90-lb. rails, it was allocated among the Illinois Steel Co., Tennessee Coal, Iron & Railroad Co., Colorado Fuel & Iron Co. and Inland Steel Co. on what is believed to be an equal basis. The International & Great Northern Railroad has asked for prices on its rail requirements for 1926, no tonnage specified. Buying of steel products by warehouses and manufacturers continues on an immediate-need basis. An inquiry is out for 125 tons of reinforcing bars for an apartment building in Wellston, a suburb.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.50c.; galvanized sheets, No. 28, 5.50c.; black corrugated sheets, 4.65c.; galvanized, 5.65c.; cold-rolled rounds, shafting and screw stock, 3.75c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{1}{2}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

Coke.—Demand for coke is active and shipments of by-product fuel exceed production. Buying of domestic coke is increasing and some sizable contracts are being placed. The principal inquiry is for 10,000 tons of domestic grades for shipment to Canada.

Old Material.—The market for old material grows weaker as pig iron strengthens, as has been noted for several weeks. Prices generally were lower this week. Consumers are not buying, and have not indicated when they will be in the market again. The country dealer is the person most affected by the present weakness, because he is forced to sell at present prices material bought at much higher quotations. Chief interest in railroad lists here is that of the Terminal Railroad Association, 3000 tons. Other lists include: Southern Railway, 6500 tons; Frisco, 2000 tons; Kansas City Southern and Texas & Pacific, 800 tons each.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails.....	\$15.00 to \$15.50
Rails for rolling.....	18.00 to 18.50
Steel rails less than 3 ft.....	18.50 to 19.00
Relaying rails, 60 lb. and under..	24.00 to 24.50
Relaying rails, 70 lb. and over..	30.00 to 31.00
Cast iron car wheels.....	17.00 to 17.50
Heavy melting steel.....	15.25 to 15.75
Heavy shovelling steel.....	15.25 to 15.75
Frogs, switches and guards cut apart.....	17.00 to 17.50
Railroad springs.....	18.50 to 19.00
Heavy axles and tire turnings...	13.00 to 13.50
No. 1 locomotive tires.....	16.50 to 17.00

Per Net Ton	
Steel angle bars.....	14.75 to 15.25
Steel car axles.....	17.50 to 18.00
Iron car axles.....	24.50 to 25.00
Wrought iron bars and transoms	19.00 to 19.50
No. 1 railroad wrought.....	13.00 to 13.50
No. 2 railroad wrought.....	12.50 to 13.00
Cast iron borings.....	11.00 to 11.50
No. 1 busheling.....	12.00 to 12.50
No. 1 railroad cast.....	15.50 to 16.00
No. 1 machinery cast.....	17.00 to 17.50
Railroad malleable.....	14.00 to 14.50
Machine shop turnings.....	8.00 to 8.50
Bundled sheets.....	9.00 to 9.50

Cincinnati

Pig Iron Price Trend Upward—Foundries Busier—Scrap Sluggish

CINCINNATI, Oct. 12.—Continued upward movement of prices is the main feature of the local pig iron market. While small quantities of Northern iron can be secured in the Iron-ton district at \$19.50, base Iron-ton, \$20 is the minimum quotation that will be made by two producers on fourth and first quarter deliveries. In territory which is free from severe competition, Iron-ton sellers have been able to get \$20.50 on lots up to 100 tons. The only Alabama furnace which has been selling as low as \$19, Birmingham, has advanced its price to \$19.50, and other furnaces in that State will not accept less than \$20 for iron for prompt shipment. All Alabama producers are holding consistently to \$20 for first quarter iron. Tennessee iron is firm at \$19, Birmingham, while Jackson County silvery furnaces are maintaining prices recently announced in their new schedules. Sales the past week have been disappointing, but the number of inquiries is a forecast of considerable first quarter buying in the immediate future. Aside from sales of 1000 tons of silvery for the first quarter, a like quantity of Northern iron to a southern Ohio melter for November delivery and 500 tons of Northern foundry to an Indiana consumer for shipment over the remainder of the year. Sales have been unimportant.

General Motors Corporation is in the market for 14,000 tons of foundry and malleable iron for fourth quarter delivery to Detroit, Saginaw and Flint, Mich., foundries. Although this company has a contract with a Cleveland concern for its pig iron needs, its requirements have been so great in the past month that it is not only taking the maximum tonnage specified in its contract, but is also forced to seek iron from other sources. The Link-Belt Co. is inquiring for 3000 to 5000 tons of malleable iron for its Indianapolis plant, shipments of which are to begin in December. The

Standard Sanitary Mfg. Co. is negotiating for 1500 tons of iron for its Louisville, Ky., factory, for first quarter delivery, but it is probable that the company will close for a much larger tonnage.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	\$23.05 to \$24.05
Alabama fdy., sil. 2.25 to 2.75	23.55 to 24.05
Tennessee fdy., sil. 1.75 to 2.25	23.05
Southern Ohio silvery, 8 per cent	28.27
Southern Ohio fdy., sil. 1.75 to 2.25	21.77 to 22.27
Southern Ohio, malleable	21.77 to 22.27

Bars, Plates and Shapes.—An important Eastern seller states that orders and specifications for bars in the past week called for a greater tonnage in the aggregate than in any previous week this year. The fact that most of this business consisted of comparatively small lots denotes a healthy industrial condition in this territory. There is a noticeable absence of contracts covering fourth quarter requirements and both producers and consumers are satisfied to limit transactions to tonnages for prompt shipment. Buyers are no longer resisting 2c., Pittsburgh, as the prevailing price on bars, and even the large consumers are accepting the quotation without protest. Shapes are growing firmer at 2c., Pittsburgh, and it is becoming increasingly difficult to find a seller who is willing to shade this figure. Sales of plates are lagging. Prices continue soft, despite the desire of the larger mills to establish 1.90c., Pittsburgh, as the minimum. Attractive tonnages are bringing out quotations as low as 1.80c. Fabricators are fairly busy, but are compelled to take work at extremely low prices because of the severe competition.

Sheets.—A liberal volume of sales, about on a par with those during the same period in September, is reported by local sellers. Consumers are calling for quick deliveries, but mills are being forced to extend shipping dates in many cases because of a pronounced increase in buying. Although producers failed recently in their attempt to advance galvanized sheets to 4.30c, Pittsburgh, another effort is under way. However, 4.20c., Pittsburgh, has not been eliminated and considerable tonnage has been disposed of at that price. Black sheets are inactive and quotations range from 3.10c. to 3.15c., Pittsburgh. Blue annealed sheets are displaying strength at 2.25c. to 2.30c., Pittsburgh, while automobile sheets are firm at 4.25c., Pittsburgh. Mills in this territory are operating at 85 per cent of capacity.

Wire Goods.—A consistently good demand for fencing and other wire goods is attributed to improved conditions in the agricultural districts of western Ohio and eastern Indiana. Prices on all commodities except common wire nails and plain wire are being well maintained. Although an independent Ironton mill has not yet begun operating its own barge line, it has already started shipping common wire nails to Cincinnati at a delivered price of \$2.65 per keg, which is equivalent to \$2.55, Ironton, or \$2.36, Pittsburgh. Eastern mills refuse to lower their quotations to this level and are holding to \$2.74 delivered here, or \$2.45, Pittsburgh. A similar situation exists in plain wire, as the Ironton producer is taking business at \$2.54 per 100 lb. delivered in Cincinnati, which figures back to \$2.25, Pittsburgh, a price that Eastern sellers decline to meet.

Reinforcing Bars.—It is reported that the Middle States Construction Co. is low bidder on the general contract for a warehouse at Columbus, Ohio, for the Kroger Grocery & Baking Co., Cincinnati. The project will require 500 tons. The Southern Railway will construct a station at Charlotte, N. C., which will take 100 tons. Bids on 600 tons for a new factory for the Safe Cabinet Co., Marietta, Ohio, have been extended a week. Prices are unchanged with new billet bars selling at 2c., Cleveland, and rail steel bars at 1.90c., mill.

Warehouse Business.—The market is steady rather than strong. Machine tool builders are buying supplies more freely because of increased operations, while

demand for structural material is active. Quotations remain unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 9 annealed wire, \$3 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.40 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes: prices net per 100 ft. lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Coke.—Increased operation of foundries has resulted in a better demand for foundry by-product coke, but the price remains at \$9.64, delivered in Cincinnati. Domestic grades are extremely active and in several cases dealers have no more domestic coke to offer at \$7.14 delivered here, which is the prevailing quotation.

Old Material.—The market is still sluggish and slight interest is manifested by mills. Prices lack strength, but have not changed. Railroad lists closing this week include: Louisville & Nashville, 8000 tons; Chesapeake & Ohio, 8000 tons; Cincinnati Southern, 1000 tons; Norfolk & Western, 5000 tons, of which 700 to 800 tons is from the Portsmouth, Ohio, yards.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton

Heavy melting steel	\$14.00 to \$14.50
Scrap rails for melting	14.00 to 14.50
Short rails	18.00 to 18.50
Relaying rails	28.00 to 28.50
Rails for rolling	15.00 to 15.50
Old car wheels	13.50 to 14.00
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	15.50 to 16.00
Agricultural malleable	15.00 to 15.50
Loose sheet clippings	10.00 to 10.50
Champion bundled sheets	11.50 to 12.00

Per Net Ton

Cast iron borings	8.50 to 9.00
Machine shop turnings	7.50 to 8.00
No. 1 machinery cast	18.50 to 19.00
No. 1 railroad cast	15.00 to 15.50
Iron axles	22.50 to 23.00
No. 1 railroad wrought	11.50 to 12.00
Pipes and flues	8.50 to 9.50
No. 1 busheling	10.50 to 11.00
Mixed busheling	9.00 to 9.50
Burnt cast	9.50 to 10.00
Stove plate	10.50 to 11.00
Brake shoes	10.50 to 11.00

San Francisco

Order for 1000 Tons of German Pig Iron Placed—Structural Steel Active

SAN FRANCISCO, Oct. 10 (*By Air Mail*).—Sustained buying of structural steel, the placing of an order for about 1000 tons of German foundry pig iron, and the announcement by the Feather River Power Co. that work will be started soon on a \$45,000,000 power project in the Feather River canyon, which will require about 3000 tons of plates for a penstock, have been the chief developments in a comparatively quiet week. General business has been of a routine character and prices are practically unchanged. Eastern mill representatives incline to the opinion that firmer prices are likely in all markets in the near future. While there has been no corroborating evidence of this, the interest in structural material has helped to support a somewhat firmer price tone. In plates, however, prices have failed to strengthen, and 2.20c., c.i.f. Coast ports, has been named on a moderate sized tonnage by an independent mill. A week ago about 400 tons of structural angles, steel bars and small rounds from Antwerp arrived at this port, and during the past week a small shipment of Swedish bars has come in.

Pig Iron.—The Whiting-Mead Commercial Co., Los Angeles, has placed about 1000 tons of 2.75 to 3.25 per cent silicon pig iron with an importer representing German interests. Although verification is lacking the price is understood to have been under \$25. An unnamed interest in the San Francisco Bay district has placed about 300 tons of malleable iron with a local broker. The recent inquiry for 1000 tons of malleable

iron is understood to be still pending. Quotations are unchanged.

*Utah basic	\$27.00 to \$28.00
*Utah foundry, sil. 1.75 to 2.25....	27.00 to 28.00
**English foundry	26.00
**Belgian foundry	24.50 to 25.00
**Dutch foundry	24.00
**Indian foundry	24.00
**German foundry	25.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings known to have been closed during the week total 1914 tons, and fresh inquiries call for nearly 4700 tons. The largest job, 850 tons, was taken by the Llewellyn Iron Works for a building in Los Angeles. An auditorium in Sacramento, 504 tons, was taken by the Pacific Coast Engineering Co., and the Moore Dry Dock Co. took 225 tons for a laboratory building at Stanford University and 235 tons for a bridge at Stockton. An office building and a Shriners' temple in Oakland will require 1500 tons each. Although prices are unchanged at 2.30c. to 2.35c., c.i.f. Coast ports, there is a firmer tone to the market. This has been reflected by some mills refusing to go below 2.30c. on several fair sized tonnages.

Plates.—An Eastern independent mill has quoted 2.20c., c.i.f. Coast ports, in connection with a low freight rate and on a relatively small tonnage. However, 2.25c. to 2.30c. is more general, and few mills are inclined to go below 2.25c. on ordinary business. The Southern Pacific Equipment Co. has placed 150 tons with an Eastern mill. The Feather River Power Co. is in the market for about 3000 tons for a penstock job.

Bars.—A local reinforcing bar jobber is understood to have quoted 2.95c. during the week on less than 3 tons, cut to length. He is understood to have lost the business because his price was higher than two other quotations on the same job. For all practical purposes jobbers' prices have been withdrawn, as quotations are now being made on individual jobs as they come up for figures. Some jobbers, however, continue to quote 2.65c. to 2.75c. on carload lots for mill lengths, although business has been taken below this. The hotel in Merced, Cal., calling for 250 tons, has been abandoned. The Truscon Steel Co. has taken 280 tons for the Lafayette High School, and Gunn, Carle & Co. have taken 185 tons for the Hawthorne School, both in San Francisco.

Sheets.—Local sheet mills have booked a fairly large number of orders for galvanized sheets recently, and are making prompt deliveries. Local mills quote 4.90c. to 5c., mill, which is about equal to the Pittsburgh price of 4.20c. to 4.30c. Blue annealed sheets are slightly firmer at 2.25c. to 2.30c., Pittsburgh.

Cast Iron Pipe.—Los Angeles has awarded 3844 tons as follows: 2052 tons of 4- and 6-in. B to National Cast Iron Pipe Co., 954 tons of 4-in. B to American Cast Iron Pipe Co., and 838 tons of 8-in. B to United States Cast Iron Pipe & Foundry Co.

Warehouse Business.—A slightly increased demand for sheets and bars has been noted during the week. Prices are unchanged.

Merchant bars, \$3.30 base, per 100 lb.; merchant bars, $\frac{3}{4}$ in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles, $\frac{3}{4}$ in. and larger x $1\frac{1}{2}$ in. to 2 $\frac{1}{2}$ in., inc., \$3.30 base, per 100 lb.; channels and tees, $\frac{3}{4}$ in. to 2 $\frac{1}{2}$ in., inc., \$3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.30 base, per 100 lb.; tees, 3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates, $\frac{3}{4}$ in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel, $\frac{1}{4}$ in. and thicker, \$6.30 base per 100 lb.; wire nails, \$3.50 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$3.70 per 100 lb.; No. 28 galvanized sheets, \$5.75 per 100 lb.; No. 28 black sheets, \$4.65 per 100 lb.

Coke.—The Southern Pacific Co. has placed 500 tons of foundry coke with a local importer. A scattering of small orders has been placed during the week, but nothing of consequence has come up. Prices are unchanged. Local importers quote as follows:

English beehive, \$15 to \$16 at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

Old Material.—Interest is confined and prices are still untested by active buying.

Prices for scrap delivered to consumers' yards are as follows:

Per Gross Ton	
No. 1 heavy melting steel	\$11.50 to \$12.00
Scrap rails, miscellaneous	11.50 to 12.00
Rolled steel wheels	11.50 to 12.00
Couplers and knuckles	11.50 to 12.00
Mixed borings and turnings	6.00 to 6.50
Country mixed scrap	8.00 to 8.50
No. 1 cast scrap	19.50 to 20.00

Birmingham

Pig Iron Strong—Cast Iron Pipe Demand Active and Prices Higher

BIRMINGHAM, Oct. 13.—Pig iron quotations in the South show an upward trend, though sales are still generally confined to small lots. One small furnace is reported to have disposed of a few carlots of No. 2 foundry at as high as \$21 f.o.b. Birmingham. The largest producer of merchant iron has been holding firm at \$20 and \$19.50 appears to be minimum for this district. A few sales ranging from 1500 to 5000 tons have been made and there is considerable unfilled tonnage on the books. Some inquiries have been made for shipment outside this district. Production is steady and a further reduction in merchant stocks is not denied. The two blast furnaces under repair will hardly be ready for operation until next month and since no immediate increase in output is to be expected, higher prices for pig iron by the end of the month are quite possible.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil....	\$19.00 to \$20.00
No. 1 foundry, 2.25 to 2.75 sil....	20.00 to 21.00
Basic	19.50
Charcoal, warm blast.....	30.00 to 32.00

Rolled Steel.—Several mills are behind on deliveries and the rail mill of the Tennessee Coal, Iron & Railroad Co. has enough unfilled orders to keep the plant busy for months ahead. This company will begin making deliveries on the 24 steel barges for the Warrior River development during December. Soft steel bars remain at 2.05 to 2.15 cents, Birmingham.

Cast Iron Pipe.—Quotations are firm at \$42 for 6-in. and over cast iron pressure pipe, an advance of \$1 in the past 10 days; \$46 is being asked for 4-in. to 6-in. pipe. The demand is strong and pipe shops are operating to capacity with much business still in sight. Production for the year will show an increase in comparison with the previous year. Present indications point to steady production during the winter, on deliveries to sections where severe weather does not interfere with construction.

Coke.—The coke market has firmed up somewhat in the last few days and sales are being made at \$5 per ton for by-product foundry coke and \$5.50 for bee-hive foundry coke. The Semet-Solvay Co. is developing its own coal mines in order to place the output of the by-product plant at Ensley on the commercial market.

Old Material.—More scrap is being melted than at any time this year. Dealers are still declining long time contracts and quotations have shown no advances in the last few days. Heavy melting steel is being consumed in quantity. Many foundries and machine shops are using scrap as well as pig iron and even furnace interests are taking on some old material.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	13.00 to 14.00
Railroad wrought.....	12.00 to 13.00
Steel axles	13.00 to 20.00
Iron axles	17.00 to 19.00
Steel rails	13.00 to 14.00
No. 1 cast.....	16.00 to 17.00
Tramcar wheels	16.00 to 17.00
Car wheels	15.00 to 16.00
Stove plate	13.00 to 14.00
Machine shop turnings.....	7.00 to 8.00
Cast iron borings.....	7.00 to 8.00
Rails for rolling.....	16.50 to 17.00

New York

Small-Lot Buying of Pig Iron—Activity in Building and Car Repair

NEW YORK, Oct. 13.—Apart from the considerable inquiries heretofore reported for pig iron for the first quarter of 1926 from radiator foundries, no very large tonnages are before local sellers. Transactions of the past week have been chiefly of the small-lot order and the total is probably not more than 5000 tons. Moore Brothers, Elizabethport, N. J., have taken 200 tons each of No. 1X and Bessemer iron from eastern Pennsylvania furnaces. Louis Sacks, Inc., Newark, is reported to have bought 600 tons of No. 2X and 125 tons of malleable for first quarter. Its original inquiry was for first half. Current prices are not far from \$21, eastern Pennsylvania furnace, and \$19, Buffalo. However, some sharply competitive business in New England that went to an eastern New York furnace rather than to Buffalo represented a price considerably below the \$19 Buffalo level. A certain amount of German foundry iron is included in each week's sales. Such iron of standard analysis has sold of late at \$20, duty paid, North Atlantic ports, though in the past week \$20.25 has been asked. Among inquiries of the week is one for 200 tons of No. 2 plain foundry for spot shipment to eastern Pennsylvania, and the New Jersey Zinc Co. is in the market for 500 tons of No. 2X for the first quarter. In view of the fuel situation some furnaces are not willing to quote on 1926 iron. The melt of foundries in territory tributary to New York is growing gradually, but meanwhile smaller buyers of pig iron are confining their purchases to the near future. In contrast is the action of a large radiator interest which has bought iron for some of its foundries in the Middle West for first quarter delivery. Its inquiry for 15,000 to 20,000 tons for Bayonne, N. J., delivery is still pending. There are reports of further considerable buying of Middlesbrough, England, pig iron on American account. The iron, according to the English description, is "low phosphorus Cleveland iron" for foundry use.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25..	\$23.02 to \$23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.52 to 24.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	24.02 to 24.52
Buffalo, sil. 1.75 to 2.25 (all rail)	23.41 to 23.91
Buffalo, sil. 1.75 to 2.25 (by barge canal del'd alongside in lighterage limits N. Y. and Brooklyn)	21.25 to 21.75
No. 2 Virginia, sil. 1.75 to 2.25..	29.54

Ferroalloys.—Demand for ferromanganese is light and confined to a few inquiries for 100 to 200-ton and smaller lots. Consumers are buying only very close to their needs. The same is true of spiegeleisen. Prices are unchanged for both alloys.

Warehouse Business.—Not only is a good volume of business reported in most products, but greater firmness in prices, notably in black and galvanized sheets, is in evidence. A slight increase in demand and an advance of 10c. per 100 lb. by a few jobbers has brought the minimum price on black and galvanized to 4c. and 5c. per lb. respectively. Whether this is a permanent advance or only the result of an effort to advance the market has not yet been demonstrated. Structural sales continue an active part of the market with the 3.24c. per lb. base holding fairly well, except on the more desirable orders, on which concessions of a few cents per 100 lb. are reported. Pipe discounts are still unstable with concessions from the usual discounts available on occasion. Prices are quoted on page 1096. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Finished Iron and Steel.—Blue annealed and black sheets have advanced \$1 a ton to 2.30c. and 3.15c., base Pittsburgh, respectively, and galvanized has gone up \$2 a ton to 4.30c. On the eve of the advances considerable tonnage was placed for both spot and forward shipment, some purchases covering 30 to 60 days' requirements. Although the new prices are still largely untested, they are being adhered to by both Corporation and independent mills. Plates are still conspicuous as the weakest of finished steel commodities. On 2000 tons of plates which the American Locomotive Co. divided among Eastern mills, 1.60c., base Pittsburgh, was done. On ordinary tonnages, 1.70c. is still a rather common quotation. The placing of repairs on 6000 all-steel hopper cars by the Pennsylvania Railroad will release orders for fully 60,000 tons of steel which, however, owing to the location of the car plants awarded the work, will undoubtedly go to mills further West. An effort is being made to advance structural shapes to 2c., base Pittsburgh, but 1.90c. is still fairly common and occasionally recessions to 1.85c. are reported. The largest fabricating award of the week, 4100 tons for a 15-story apartment building, New York, went to the Hedden Iron Construction Co. Two large new inquiries have appeared, 6000 tons for the Seamen's Bank for Savings, Wall Street, and 5000 tons for an office building on Forty-fourth Street, New York. Bars are firm at 2c., base Pittsburgh, but buyers are still reluctant to commit themselves beyond immediate requirements. Large reinforcing projects pending include the third and fourth sections of the Brooklyn sewerage development, calling for several thousand tons, subway work at both New York and Philadelphia, and a grain elevator, Philadelphia, 3200 tons. The recent weakness in wire nails accentuated hesitancy on the part of jobbers, but mills generally are again holding to \$2.65 base per keg, Pittsburgh.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 2.04c. to 2.09c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Cast Iron Pipe.—Demand from gas companies is reported as continuing in large volume and with most makers well booked on the smaller sizes to the end of the year, prices are showing considerable firmness. The American Gas & Electric Co., New York, is reported preparing specifications on a large tonnage of gas pipe for its subsidiaries. As a result of the action of the City of New York in awarding its tonnage of water pipe and fittings to the lowest American bidders, a taxpayer's injunction has been secured, probably at the instance of the Gelsenkirchener Bergwerks, low bidder on six of 15 sections. A motion to vacate the injunction will be made on Friday, Oct. 16. The soil pipe market is unsteady and weak as it enters into the usual season of dullness.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$51.60; 4-in. and 5-in., \$55.60 and \$56.60; 3-in., \$65.60 to \$66.60, with \$5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 45 to 50 per cent off list; heavy, 55 to 60 per cent off list.

Old Material.—Prices continue unsettled and the slight downward tendency of the past fortnight is still in evidence. No. 1 heavy melting steel ranges from \$16 to \$17 per ton, delivered Eastern Pennsylvania consumers, but most brokers in this district are unwilling to pay more than \$16.50 per ton delivered on a freight rate of \$3.52 per ton. Stove plate continues at \$13.50 per ton, delivered either to a Phoenixville or Harrisburgh, Pa., consumer, but is slightly weaker for local delivery, brokers offering only \$13.75 per ton, delivered to a consumer taking a \$2.02 freight rate from New York. Current shipments of machine shop turnings to a Phoenixville consumer are being purchased by the mill at \$14 per ton, which justifies the buying price of \$13.50 per ton, delivered, but brokers with contracts are

still paying up to \$14 per ton, delivered, having sold on a basis of \$14.50 per ton.

Buying prices per gross ton New York follow:	
Heavy melting steel (yard).....	\$11.50 to \$12.00
Heavy melting steel (railroad or equivalent)	13.00 to 13.50
Rolls for rolling.....	14.25 to 14.75
Relaying rails, nominal.....	23.00 to 24.00
Steel car axles.....	21.50 to 22.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	14.50 to 15.00
Forge fire	10.00 to 10.75
No. 1 yard wrought, long.....	13.50 to 14.00
Cast borings (steel mill).....	9.75 to 10.25
Cast borings (chemical).....	13.00 to 14.00
Machine shop turnings.....	10.00 to 10.50
Mixed borings and turnings.....	9.75 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	12.25 to 12.75
Stove plate	10.50 to 11.75
Locomotive grate bars.....	11.00 to 11.50
Malleable cast (railroad).....	15.00 to 15.50
Cast iron car wheels.....	14.00 to 14.50
No. 1 heavy breakable cast.....	13.00 to 14.00
Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:	
No. 1 machinery cast.....	\$18.00 to \$18.50
No. 1 heavy cast (columns, building material, etc.), cupola size	16.50 to 17.00
No. 2 cast (radiators, cast boilers, etc.)	15.50 to 16.00

Cleveland

Radiator Company Buys 30,000 Tons of Pig Iron—Large Purchase of Heavy Melting Scrap

CLEVELAND, Oct. 13.—New demand for steel is well maintained and many mills are now comfortably filled with orders. Deliveries are extending. Some of the steel bar mills are filled up six to eight weeks and some sheet mills from four to eight weeks. Business is well scattered, but the automotive industry continues to take a large volume of steel. One leading automobile company that contracted for its expected fourth quarter requirements and later made large additional purchases, again came into the market during the week and placed a round tonnage of bar products. Plants of some of the local forge shops and other makers of automobile parts are operating to capacity. Plates are moving in fair volume, but plate mills are not accumulating much of a backlog. New inquiries have come from the Standard Oil Co. of New Jersey for stills, requiring 2300 tons of plates. Inquiry in the structural field continues light. Locally the market on steel bars, plates and structural material is firm at recent price levels. However, some weakness is still in evidence in Detroit, which for some time has been a soft spot in the market. Steel bars are firmly established in Cleveland territory at 2c., Pittsburgh. Leading producers are still making efforts to establish structural material on a 2c., Pittsburgh, basis, but on round lots 1.90c. has not disappeared. On plates 1.80c. is still the common price on car lots. Prices on alloy steels have been advanced by two makers, and two others announce that they will put higher price schedules in effect Oct. 17. An important development for the week was the restoration of the Pittsburgh basing point by several of the Ohio sheet makers. When weakness developed in the sheet market several months ago Ohio sheet mills gradually changed to the Valley, or mill, base, and recently only one or two Ohio sheet mills have been holding strictly to a Pittsburgh base. If the Pittsburgh base is now adhered to, it will be equivalent to a price advance of \$2 a ton on the bulk of the sheet business in this territory.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 3.80c.; No. 28 galvanized sheets, 4.95c.; No. 10 blue annealed sheets, 3c.; cold-rolled rounds and hexagons, 3.80c.; flats and squares, 4.30c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3 per 100 lb.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per 100 lb.

Pig Iron.—The volume of business showed a notable gain the past week and a large amount of inquiry is pending, principally for the first quarter. The American Radiator Co., which recently bought for the fourth

quarter, again came into the market, this time for the first quarter, and purchased 13,500 tons for its Detroit plant, as well as 16,000 tons for its more westerly plants. The Buick Motor Co., Flint, Mich., is inquiring for 14,000 tons of foundry and malleable iron for the fourth quarter to supplement the maximum amount that it will receive from Lake furnaces on long term contracts. The Link-Belt Co. is inquiring for 5,000 tons of malleable iron for its Indianapolis foundry for the first quarter and the Worthington Pump & Machinery Corporation wants several thousand tons for its various plants. The Peoria Malleable Iron Co., Peoria, Ill., has sent an inquiry to Ohio furnaces for 1,000 tons of malleable iron for the first quarter. Cleveland and Valley producers are getting more than the usual amount of inquiry from outside their immediate territories because their base prices are lower than those of Chicago and Detroit furnaces. However, the lower prices prevailing in these Ohio districts do not offset their much higher freight rates to some of the points from which inquiries have come. One producer sold 20,000 tons during the week, including two 5,000-ton lots, about 60 per cent of the total being for the first quarter. Part of this business came from Michigan stove and radiator manufacturers. There is a fair volume of buying in Cleveland, and a local inquiry for 2,500 tons is still pending. Foundry and malleable iron are unchanged at \$20 at furnace for Cleveland delivery and \$19.50 for outside shipment, some business being taken at the latter price. The coke situation is having a strengthening effect on the market and some of the Valley furnaces have advanced foundry and malleable iron 50c. a ton to \$19.50, although \$19 is still the more common price. One Lake furnace is now quoting a range of \$20.50 to \$21, or approximately 50c. a ton higher than a week ago. Michigan furnaces are on a \$21 basis. The minimum price on Southern foundry has been advanced 50c. a ton to \$19 base Birmingham for Tennessee iron. Low phosphorus iron is quiet after the recent spurt in buying. The market lacks strength, being adversely affected by foreign competition.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 from Birmingham:

Basic, Valley furnace	\$18.50
N't'n No. 2 fdy., sil. 1.75 to 2.25	20.50
Southern fdy., sil. 1.75 to 2.25	\$25.01 to 25.51
Malleable	20.50
Ohio silvery, 8 per cent.	\$0.52
Standard low phos., Valley furnace	27.00 to 27.50

Iron Ore.—Several ore sales in small lots were made during the week. The amount of ore on docks Oct. 1 was 7,015,683 tons, as compared with 7,404,919 tons on Oct. 1, last year. Receipts at Lake Erie ports during September were 5,646,000 tons and for the season until Oct. 1, 30,306,329 tons, as compared with 25,095,647 tons up to Oct. 1, last year. Shipments from Lake Erie ports during September were 3,646,925 tons and for the season until Oct. 1, 21,702,124 tons as compared with 18,106,332 tons until Oct. 1, last year.

Alloy Steels.—Two or three of the leading producers have withdrawn alloy steel prices because of advances on various ferroalloys. It may be several days before new price schedules are definitely established, but it is expected that an advance of from \$3 to \$5 per ton will be made on the more common alloys. Outstanding quotations are being withdrawn and sales representatives have been asked to submit inquiries direct to mills for quotations.

Semi-finished Steel.—With the increase in sheet production, mills are getting good specifications for sheet bars, most consumers now being under contract. The more common price on sheet bars, billets and slabs is \$33.50, Youngstown. A local mill quotes \$35, Cleveland.

Sheets.—The volume of sheet business continues heavy. Prices have stiffened considerably in the past week and most mills are now holding to 3.15c. for black, 2.30c. for blue annealed and 4.30c. for galvanized sheets. However, on black sheets 3.10c. has not disappeared, and a round lot was sold during the week at below 3c.

Blue annealed sheets can still be bought at 2.25c. and galvanized at 4.20c., base, Valley. Automobile body sheets are steady at 4.25c. Most of the Ohio mills have gone back to a Pittsburgh base on sheets.

Strip Steel.—Several mills have advanced hot rolled strip steel \$2 a ton to 2.30c. for strip wider than 6 in. and to 2.50c. for narrower material, including hoops and bands. However, it is too early to determine whether the market will be established at the advanced quotations. Cold rolled strip is in heavy demand, and most producers have enough orders to keep their plants running full for several weeks. The market is firm at 3.75c., Cleveland, and there is talk of an advance.

Reinforcing Bars.—Cleveland has asked for bids on a sewage disposal plant, requiring 2000 tons. While the rail steel market is firmer, 1.75c., Pittsburgh, has not disappeared on round lots, although the ruling price on carloads is 1.80c.

Bolts, Nuts and Rivets.—The demand for bolts and nuts from the automotive industry continues heavy. This is particularly true of special bolts. Orders from jobbers show some improvement but are only fair. Prices are firm. Rivets are quiet and weak with a range from \$2.40 to \$2.60. There is considerable demand from the automotive industry for small rivets on which prices are irregular.

Coke.—The market is firmer on all grades owing to the heavy demand for domestic coke, particularly from the East. Railroads are offering to provide special tariffs for Ohio by-product coke for Eastern shipment, if producers wish to crush coke to domestic sizes. Foundry coke is quoted at \$4.50 for \$5 for standard Connellsville brands and \$7.50 for Ohio by-product coke. Heating coke ranges from \$3.90 to \$4.35.

Old Material.—The market shows a little more life and is firmer, with advances on heavy melting steel, cast iron borings and a few other grades. A Youngstown mill is reported to have purchased 15,000 tons additional of heavy melting steel at \$18.25 and another Valley district mill is credited with a round lot purchase at the same price. A Cleveland consuming company which had held up shipments for some time is now taking blast furnace scrap in limited quantities. Dealers look for somewhat better prices and are not showing the timidity about buying "long" that they did for several weeks.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$17.00 to \$17.50
Rails for rolling.....	16.75 to 17.00
Rails under 3 ft.....	19.00 to 19.50
Low phosphorus melting.....	17.75 to 18.25
Cast iron borings.....	13.50 to 13.75
Machine shop turnings.....	12.00 to 12.50
Mixed borings and short turnings.....	13.50 to 13.75
Compressed sheet steel.....	14.50 to 15.00
Railroad wrought.....	13.50 to 14.00
Railroad malleable.....	18.75 to 19.25
Light bundled sheet stampings.....	11.25 to 11.50
Steel axle turnings.....	14.75 to 15.25
No. 1 cast.....	18.00 to 18.50
No. 1 busheling.....	13.00 to 13.25
Drop forge flashings.....	12.50 to 13.00
Railroad grate bars.....	13.50 to 13.75
Stove plate.....	13.50 to 13.75
Pipes and flues.....	10.50 to 11.00

Detroit Scrap Stronger

DETROIT, Oct. 12.—With one Ohio consumer releasing scrap shipments and another holding up present orders, tonnage consumption in this district remains the same as a week ago. Dealers generally do not seem anxious to sell and there is an undertone that forecasts a stronger market in the near future. Flashings registered an advance of 50c., with other prices remaining same as quoted a week ago.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel.....	\$14.25 to \$14.75
Borings and short turnings.....	11.25 to 11.75
Long turnings.....	10.00 to 10.50
No. 1 machinery cast.....	15.00 to 16.00
Automobile cast.....	21.00 to 22.00
Hydraulic compressed.....	13.00 to 13.50
Stove plate.....	12.50 to 13.00
No. 1 busheling.....	12.75 to 13.25
Sheet clippings.....	8.75 to 9.25
Flashings.....	12.50 to 13.00

Philadelphia

Reading Railroad Buys 3500 Tons of Bars Abroad—Markets Are More Active

PHILADELPHIA, Oct. 13.—Of several interesting developments in this week's markets one of the most striking is the placing of an order for 3500 tons of German concrete reinforcing bars for a Reading railroad grain elevator. The price on the foreign material was 1.97c., c.i.f. Philadelphia, duty paid. American makers of bars rolled from new billets at \$5 to \$7 higher were out of the running.

Foreign steel, like foreign pig iron, is becoming increasingly a factor on the Atlantic seaboard. Among recent sales is one of 1500 tons of structural shapes to a Texas fabricator. An American company which ships a good share of its finished products abroad is considering a large tonnage of foreign shapes and bars because of the advantage to be derived from the drawback on the exported products.

In the finished steel market the principal news has to do with the increasing of prices on sheets, wire nails and hot rolled strips and fresh weakness in plates, shapes and bars. Plates have been sold in large tonnages at 1.60c. and 1.65c., Pittsburgh, by Eastern mills.

A flurry in coke, caused largely by increasing demand for domestic sizes, has caused most of the eastern Pennsylvania pig iron producers to withdraw from the market on first quarter inquiries, as they do not know what their coke costs for that period will be, and coke operators are not quoting for future delivery. Some furnaces in the East are sold up for fourth quarter. Prices are firm on the basis of \$21 for foundry iron with a tendency to advance. Meanwhile foreign iron is being sold in large lots, one sale of 2500 tons and another of about 5000 tons having been made within the week. Foreign iron sales for first quarter are conspicuous.

Renewed strength in the scrap market has followed reports of sales in the Pittsburgh and Youngstown districts aggregating close to 75,000 tons, but Eastern mills are buying very little.

Pig Iron.—Interest of consumers in first quarter iron has quickened because of the coke situation and the prospect of a further advance in iron prices. Eastern Pennsylvania producers have not been able to buy coke for first quarter, and not knowing what their costs will be have almost without exception withdrawn from the market for that period. Some of them are sold up for fourth quarter and are making quotations only for carload lots for early shipment. Greatly increased demand for domestic coke has advanced prices of that grade to \$8.50 and some ovens in the Connellsville district are taking first and second drawings and breaking the coke up to domestic sizes rather than let it remain in the ovens for the 72 hr. required for good foundry coke. The minimum on foundry coke is \$5.50 and there were indications today that this price wouldn't remain in effect long, as some brokers were unwilling to quote less than \$6. This is for a grade of coke which last week was being sold at \$4.75. Approximately the same prices are being named on furnace coke, but only for immediate shipment. Importers of foreign iron are taking full advantage of the situation and have sold heavily for both fourth quarter and first quarter. Some good sized foreign contracts have been closed, among them one for 2500 tons and another for about 5000 tons. A manufacturer who has imported considerable pig iron received a cablegram today that 50,000 tons of Middlesbrough (English) iron had been sold to an American company. This may have been confused with a sale of 35,000 tons of English low phosphorus iron reported by cable to THE IRON AGE this week. In any event no intimation as to the buyer was obtainable here today. There was a conjecture that the buyer, if the report is true, might be a large American company which is a user of this grade of iron in its English plant. Cast iron pipe and soil pipe makers have been among the most active buyers of both domestic and foreign iron and

some of them are anxious to get covered through the first half of 1926. Indian iron is being sold usually at \$21, c.i.f. Philadelphia, duty paid, for the base grade, although \$20.50 was named on one large sale. German iron is being offered by a local broker at \$20.50, c.i.f. Philadelphia, duty paid. Domestic prices are firm at the \$21 base, but the Bethlehem Steel Co., which is well sold up for fourth quarter, though having 28 out of 43 furnaces at all plants in blast, is frequently quoting \$21.50 and the Delaware River Steel Co., also well sold up for the rest of the year, is also quoting \$21.50 as its minimum. A New York State furnace, quoting \$19, with a \$3.65 freight rate to Philadelphia, is selling considerable iron in this district, its delivered prices at many points meeting the delivered prices on eastern Pennsylvania iron. A Virginia cast iron pipe foundry has bought 5000 tons from a Virginia furnace, added to 10,000 tons bought about two weeks ago. The foundry melt is obviously increasing in this district as furnaces are now getting frequent requests to hurry shipments and even to anticipate delivery dates.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	21.76 to 22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.63
East. Pa. No. 1X.....	22.76 to 23.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic delivery eastern Pa.....	21.00 to 21.50
Gray forge	21.00 to 22.00
Malleable	22.25 to 22.75
Standard low phos. (f.o.b. furnace)	22.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	22.50 to 23.50

Ferroalloys.—No change has developed in the ferromanganese situation, the price remaining at \$115 for both domestic and foreign. Sales are small.

Billets.—A local manufacturer has bought 750 tons of rerolling and forging billets at a concession of about \$1 a ton. The Eastern market has been weak for some time, but orders have been too small to bring out concessions of more than 50c. a ton. We now quote open hearth rerolling billets at \$34 to \$35, Pittsburgh, with a \$5 extra for forging quality.

Plates.—Further weakness in plate prices and more liberal buying have been the coincident developments of the week. The American Locomotive Co. divided 2000 tons of plates among Eastern mills. The base price was 1.60c., Pittsburgh, which was not a surprising cut considering that the material was loaded with heavy extras, in some cases as much as \$35 a ton. The Pusey & Jones shipyard at Wilmington, Del., has bought 1300 tons for two Ericsson Line boats at a reported price of 1.65c., Pittsburgh. The Baldwin Locomotive Works will require about 1000 tons of plates for 35 locomotives it has recently sold. Most of the current orders are at 1.70c. and one company has advanced its quotation on less than carload lots to 1.80c. Tonnage placed with Eastern mills is showing a steady increase. The Lukens Steel Co. will increase production by putting on another open-hearth furnace this week, making 11 in operation.

Structural Steel.—Activity in structural steel projects in this district is increasing and several thousand tons has been placed in the last week. The Jones & Laughlin Steel Corporation, which has not done much fabricated work recently for Eastern buyers, has been awarded 2200 tons for a Sesqui-Centennial Exposition building and 650 tons for a radio manufacturing building. The Belmont Iron Works will fabricate 2200 tons for the Reading Co.'s grain elevator at Port Richmond, Philadelphia. The price situation remains chaotic, Philadelphia being one of the weakest spots in the country. Most of the larger mills adhere firmly to 1.90c., Pittsburgh, but Eastern mills have made sales at prices much lower. In a few cases the price paid has been about 2c., Philadelphia. Pittsburgh mills would have to quote 1.78c. to meet that delivered price. The Sesqui-Centennial Exposition will soon ask for bids on four buildings totaling 8000 to 10,000 tons of steel. Foreign shapes are coming in at Atlantic and Gulf ports in increasing quantities.

Bars.—American mills would not meet the low price quoted on 3500 tons of German Siemens-Martin concrete reinforcing bars for the Port Richmond grain elevator to be built for the Reading railroad. The order went to a local importer whose price of 1.97c., c.i.f. Philadelphia, duty paid, was \$5 to \$7 lower than some domestic quotations. A domestic maker, but not one of the larger producers, quoted 2.06c., delivered, which presumably was on rerolled material. The 2c. quotation put into effect the first of the month by all of the larger makers has not been rigidly adhered to. Most of the important consumers covered for their fourth quarter requirements at 1.90c., Pittsburgh, and the effect of this has been to weaken the 2c. price except on small lots. Bar iron is in fair demand with prices unchanged at 2.12c. to 2.17c., Philadelphia.

Sheets.—New sheet prices, yet untested, are in effect, namely 2.30c. on blue annealed, 3.15c. on black and 4.30c. on galvanized, all Pittsburgh basis, which recalls the effort made a month or so ago to advance prices to the same levels, a move that did not succeed. Now, however, many of the mills have better backlogs and there is a good deal of insistence on the part of sellers that these prices will be firm. Sales within the past week have averaged \$2 to \$3 a ton below these figures.

Hot Rolled Strip Steel.—Eastern offices of companies making hot rolled strips have been advised to accept no business under 2.30c., Pittsburgh, for strips 6 in. wider, and 2.50c. for narrow strips. This is an advance of \$2 a ton.

Wire Nails.—Mills which have been selling wire nails at \$2.60, Pittsburgh, have restored the \$2.65 quotation, which they declare will not be shaded.

Pipe.—The Reading Iron Co. has received an order through the Amtorg Trading Corporation, New York, for about 2500 tons of wrought iron pipe for shipment to Russian oil fields. Shipment will be completed within 10 or 12 weeks. Further buying for Russia of about the same tonnage is expected.

Imports.—Last week's imports at Philadelphia included 4525 tons of pig iron from England and 200 tons from the Netherlands; 7913 tons of iron ore from Sweden and 80 tons from Germany; 334 tons of structural steel from Luxemburg.

Old Material.—While the Eastern scrap situation has not changed, as reflected by prices, a greater confidence exists among brokers and dealers as a result of reports of sales aggregating about 75,000 tons of steel scrap in the Pittsburgh and Youngstown districts. Eastern mills have not paid above \$17 in the week, but brokers are not willing to sell tonnages at less than \$17.50. Sales at \$17 are confined to small lots. There is a little more strength in cast scrap due to the firmness of the pig iron market, but sales are not plentiful. Other grades are unchanged.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel.....	\$16.50 to \$17.00
Scrap rails	16.50 to 17.00
Steel rails for rolling.....	18.00 to 18.50
No. 1 low phos. heavy 0.04 and under	21.50 to 22.00
Couplers and knuckles.....	21.00 to 21.50
Rolled steel wheels.....	21.00 to 21.50
Cast iron car wheels.....	18.50 to 19.00
No. 1 railroad wrought.....	18.00 to 18.50
No. 1 yard wrought.....	17.00 to 17.50
No. 1 forge fire.....	14.00 to 14.50
Bundled sheets (for steel works)	14.00
Mixed borings and turnings (for blast furnace use).....	13.50 to 14.00
Machine shop turnings (for steel works use)	14.00
Machine shop turnings (for rolling mill use).....	14.50 to 15.00
Heavy axle turnings (or equivalent)	15.00 to 15.50
Cast borings (for steel works and rolling mill).....	14.00
Cast borings (for chemical plant)	16.00 to 16.50
No. 1 cast.....	18.00 to 18.50
Heavy breakable cast (for steel plants)	17.00 to 17.50
Railroad grate bars.....	14.50
Stove plate (for steel plant use)	14.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.50
Shafting	23.00 to 24.00
Steel axles	24.00 to 25.00

STRUCTURAL STEEL

Awards Total Close to 40,000 Tons and New Projects Are Over 27,000 Tons

With awards totaling close to 40,000 tons and new projects going above 27,000 tons, the past week has kept pace with recent high records in structural steel. There were two awards exceeding 3000 tons, but the total is made up of comparatively small work. Among new projects is a bank building in New York, requiring 6000 tons and an office building of 5000 tons. A building for the Sesqui-Centennial Exposition, Philadelphia, taking 2200 tons, was awarded and four other buildings, which will require a total of 8000 to 10,000 tons, will be in the market soon. Awards follow:

Apartment building, 101st Street and Broadway, New York, 4100 tons, to Hedden Iron Construction Co.

Sheffield Farms Co., New York, building, 400 tons, to George A. Just Co.

Office building, Winston-Salem, N. C., 1500 tons, to McClintic-Marshall Co.

Florida East Coast Railroad, viaduct, 1700 tons, to Virginia Bridge & Iron Co.

Frederick Cranford, Brooklyn, N. Y., contractor, subway shoring, 300 tons, to American Bridge Co.

Greensborough, N. C., bridges, 500 tons, to McClintic-Marshall Co.

Central Railroad of New Jersey, two bridges, 1600 tons, reported awarded to American Bridge Co.

Apartment building, Great Neck, L. I., N. Y., 700 tons, previously reported, was awarded to the Porcupine Co.

Telephone exchange, Everett, Mass., 125 tons, to New England Structural Co.

Taylor Allderice high school, Pittsburgh, 1200 tons, to J. E. Moss Iron Works.

Old National Bank, Lima, Ohio, 750 tons, to American Bridge Co.

Cincinnati *Enquirer*, building, 3150 tons, to Massillon Bridge & Structural Co.

Public Service Co. of Northern Illinois, Waukegan, Ill., addition to power plant, 3850 tons, to American Bridge Co.

Great Northern Railway Co., stringers for ore dock No. 4, Allouez, Wis., 200 tons, to American Bridge Co.

Chicago, Burlington & Quincy Railroad, mail building, Omaha, Neb., 1100 tons to Paxton & Vierling Iron Works.

Milwaukee Electric Railway & Light Co., Milwaukee, Menominee Valley viaduct, 600 tons, to Wisconsin Bridge & Iron Co.

Senior high school, Marquette, Mich., 120 tons, to Worden-Allen Co.

Standard Oil Co. building, Michigan Avenue, Chicago, addition, 1900 tons, to American Bridge Co.

Universal Portland Cement Co., Burlington, Ill., conveyor bridge, 700 tons, to American Bridge Co.

A. O. Smith Corporation, Milwaukee, factory building, 1500 tons, to Milwaukee Bridge Co.

Great Northern Railway Co., bridges, 1500 tons, to Milwaukee Bridge Co.

Federal Rubber Co., Cudahy, Wis., 600 tons, to American Bridge Co.

Remy Electric Co., Anderson, Ind., factory building, 425 tons, to Indiana Bridge Co.

Roxana Petroleum Corporation, oil tanks, 2000 tons, to Graver Corporation.

Art Center Building, Lebanon Street, Los Angeles, 850 tons, to Llewellyn Iron Works.

Bridge across the Santa Ana River at San Bernardino, Cal., 100 tons, to Virginia Bridge & Iron Co.

Bridge across the Mormon Channel, Stockton, Cal., 235 tons, to Moore Dry Dock Co.

Auditorium, Sacramento, Cal., 504 tons, to Pacific Coast Engineering Co.

Leland Stanford, Jr., University, Palo Alto, Cal., laboratory, 225 tons, to Moore Dry Dock Co.

Southern Pacific Equipment Co., San Francisco, 150 tons, to an Eastern mill.

Sesqui-Centennial Exposition, Philadelphia, building No. 1, 2200 tons, to Jones & Laughlin Steel Corporation.

Atwater Kent Mfg. Co., Philadelphia, addition to radio manufacturing plant, 650 tons, to Jones & Laughlin Steel Corporation.

Reading Co., grain elevator at Port Richmond, Philadelphia, 2200 tons, to Belmont Iron Works; previously reported as having been awarded to Bethlehem Fabricators, Inc.

Hazard Mfg. Co., Wilkes-Barre, Pa., manufacturing building, 635 tons, to Bethlehem Fabricators, Inc.

Bridge over Susquehanna River at Halstead, Pa., 500 tons, to an unnamed fabricator.

Highway bridge at Williamsport, Pa., 235 tons, to Phoenix Bridge Co.

Office building, Thirteenth and Chestnut Streets, Philadelphia, 175 tons, to Phoenix Bridge Co.

Office building, Sixteenth and Chestnut Streets, Philadelphia, 750 tons, to Phoenix Bridge Co.

Philadelphia Art Museum, addition, 110 tons, to Phoenix Bridge Co.

Grandstand at York, Pa., 200 tons, to Phoenix Bridge Co.

Hanes Hosiery Mills, Winston-Salem, N. C., 500 tons, to Phoenix Bridge Co.

State school, Rome, N. Y., 150 tons, to Phoenix Bridge Co.

Lycoming Creek bridge, Hepburnville, Pa., 240 tons, to Phoenix Bridge Co.

Y. M. C. A. Building, Philadelphia, addition, 300 tons, to Bethlehem Fabricators, Inc.

W. & J. Sloane Mfg. Co., interior work of linoleum manufacturing plant at Trenton, N. J., 500 tons, to Shoemaker Bridge Co.

Cobb's Creek bridge, Philadelphia, 140 tons, to American Bridge Co.

Girls Catholic High School, Philadelphia, 750 tons.

Halle Brothers, Cleveland, subway, 135 tons, to Forest City Structural Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Apartment building, 207 West 106th Street, New York, 1000 tons.

Apartment building, 430 East Fifty-seventh Street, New York, 1000 tons.

Building at Fiftieth Street and Fifth Avenue, New York, 500 tons.

Seamen's Bank for Savings, New York, bank and offices, 6000 tons.

Apartment building, 810 Fifth Avenue, New York, 700 tons.

Office building on Forty-fourth Street, New York, 5000 tons.

Apartment building, Fifty-sixth Street and Park Avenue, New York, 1500 tons.

American Bemberg Corporation, Johnson City, Tenn., factory, 1500 tons.

New York Central Railroad, Chicago, bridge repairs, 700 tons.

American Laundry Machinery Co., Cincinnati, plant addition, 150 tons.

Champion Coated Paper Co., Hamilton, Ohio, building, 200 tons.

Studebaker Corporation, South Bend, Ind., spring plant, 1000 tons.

Store and loft building, Fourth Street between Jessie and Stevenson Streets, San Francisco, 1100 tons.

Apartment building, Jackson and Steiner Streets, San Francisco, 250 tons.

Hotel, Page and Franklin Streets, San Francisco, 175 tons.

Shriners' Temple, Thirteenth Street, Oakland, Cal., 1500 tons.

Office building, Seventeenth Street between Broadway and Telegraph Avenue, Oakland, 1500 tons.

Feather River Power Co., San Francisco, 3000 tons of plates for a penstock.

The American Mining Congress will hold its 23th annual convention at Washington on Dec. 9, 10 and 11, the first to be held at the national capital. Features of the program will be discussions on taxation, standardization of mining machinery, equipment and practice, and stabilization of the mining industry. Louis S. Cates of Salt Lake, general manager Utah Copper Co., is president.

August shipments of steel furniture are reported by the Department of Commerce at \$1,689,977, compared with \$1,810,754 (revised) for July. The current figure is the lowest since last November. Orders received during August aggregated \$1,665,730, also the lowest since November. Unfilled orders at end of August amounted to \$1,438,889, or somewhat less than a month's operation at current rates.

NON-FERROUS METALS

The Week's Prices

		Cents per Pound for Early Delivery			
		Copper, New York		Lead	
		Lake	Electro-lytic*	New York	St. Louis
Oct.					
7.....	14.50	14.12½	60.92½	9.60	9.25
8.....	14.50	14.12½	61.00	9.60	9.25
9.....	14.62½	14.25	61.62½	9.60	9.25
10.....	14.62½	14.25	.....	9.60	9.25
13.....	14.62½	14.37½	62.12½	9.60	9.25

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Oct. 13.

The markets are all strong and moderately active. The Columbus holiday yesterday, Oct. 12, has slowed up activity this week. Copper is higher with better demand. Tin is advancing rapidly on good buying. Lead is practically unchanged. Zinc continues its advance.

Copper.—A sudden change in London quotations last Friday, Oct. 9, when prices advanced quite sharply was reflected here in higher values. Consumers, who had been holding off, came into the market and had to pay 14.50c., delivered, whereas on the days previous to this they could have bought at 14.37½c. A fair amount of business was done. Since then London prices have continued to strengthen and today it is practically impossible to buy electrolytic copper at less than 14.62½c., delivered. Lake copper is quoted at 14.62½c. to 14.75c., delivered.

Tin.—In a quiet way the tin market has been active the past week. Sales up to and including Friday, Oct. 9, were 1100 to 1200 tons. About two-thirds of this was taken by consumers. A few sales were made on the New York Metal Exchange on Oct. 8, one buyer taking all the cheap tin available. With the holiday yesterday business has been slow today with spot straits quoted at 62.12½c., New York, with the market quiet but firm. London prices today were about £8 per ton higher than a week ago with spot standard quoted at £277 5s, future standard at £277 15s and spot straits at £285 2s 6d. The Singapore price was £284 2s 6d.

Lead.—The market is unchanged and firm. The leading interest in the East continues to quote 9.50c., New York, as its contract price. The largest producer in the West is quoting 9.25c., St. Louis. We quote the outside market 9.60c., New York, or 9.25c., St. Louis.

Zinc.—Demand from foreign consumers continues with advancing prices. Prime Western zinc is quoted today at 8.20c., St. Louis, or 8.55c., New York, for early delivery with spot 8.25c., St. Louis. Values in London yesterday and today advanced affecting prices here. The statement of a large reduction in stocks during September, made public last week, has strengthened the whole market.

Old Metals.—The market is strong and inquiry active. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible.....	14.25
Copper, heavy and wire.....	13.25
Copper, light and bottoms.....	11.50
Heavy machine composition.....	10.25
Brass, heavy.....	8.75
Brass, light.....	7.75
No. 1 red brass or composition turnings..	9.75
No. 1 yellow rod brass turnings.....	9.50
Lead, heavy.....	8.50
Lead, tea.....	7.00
Zinc.....	5.25
Cast aluminum.....	20.50
Sheet aluminum.....	20.50

Nickel.—Ingot nickel in wholesale lots is quoted at 34c. with shot nickel at 35c. Electrolytic nickel is available at 38c. per lb.

Antimony.—Wholesale lots of Chinese metal are a little easier than a week ago at 17c., New York, duty paid. October-November shipment from China is quoted at 16.75c. to 17c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is unchanged at 27c. to 28c. per lb.

Chicago

OCT. 12.—The price of copper is unchanged and tin has advanced under the influence of a stronger foreign market. Lead and zinc, also, have advanced in an active market, both at home and for export. Antimony is not in great demand and the price remains unchanged. Among the old metals, tin, zinc and pewter have advanced. We quote, in carload lots: Lake copper, 14.65c.; tin, 62.75c.; lead, 9.45c.; zinc, 8.20c.; in less than carload lots, antimony, 18.50c. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 10c.; red brass, 9c.; yellow brass, 7.75c.; lead pipe, 8c.; zinc, 5c.; pewter, No. 1, 35c.; tin foil, 42c.; block tin, 50c.; all being dealers' buying prices for less than carload lots.

Berkeley Fabricating Shop Adding Capacity

SAN FRANCISCO, Oct. 10.—Additions to its present plant, in order to handle work on the Mokelumne pipe line job have been started by the Steel Tank & Pipe Co., Fourth and Howard Streets, Berkeley, Cal. The additions include four large buildings, which will cost in excess of \$40,000, according to C. A. P. Duffie, general manager of the company. One structure 120 x 250 ft. will be used for pipe construction work; a second, 50 x 180 ft., for housing machinery; another, 50 x 260 ft., for painting, wrapping and shipping, and the fourth, 120 x 120 ft., will be used as a storehouse. Additional men for the shops and in the field will be taken on as soon as fabrication of the 75,000 tons of plates required for the job is under way. There are now about 300 men employed in the shops which occupy a 16-acre site. Mr. Duffie plans to leave soon for the East to purchase machinery and other equipment.

Suggests Secretary Hoover as Good Will Ambassador

A suggestion that Herbert Hoover be made a special United States ambassador of commerce and good will and that he tour the world in that capacity was made by Bennett Chapple, publicity director of the American Rolling Mill Co., in an address on "Building Good Will Abroad," before the Ohio Valley Foreign Trade Conference in Cincinnati on Oct. 6. Mr. Chapple pointed out that Great Britain is several laps ahead of the world in the advertising being done by the Prince of Wales and that our Government can do no better than follow her example. He suggested further that a representative of the Department of Commerce be placed on every battleship as an emissary of trade extension and good will in every port.

W. H. Rastall, chief of the industrial machinery division, United States Department of Commerce, discussed British and German competition in foreign trade.

Cromwell Steel Co. Equipment Sold

The plant equipment of the Cromwell Steel Co., Lorain, Ohio, has been sold to J. W. Dana and associates at Kansas City, to be installed in the plant of the recently incorporated Kansas City Steel Corporation. There are four open-hearth furnaces, a 30-in. bar mill and a 20-ton steam hammer, the last named having been used in place of a blooming mill for breaking down ingots. The property of the Cromwell Steel Co. was sold under receivership in 1922 to a trustee of the bondholders' committee. A new company was organized under the name of the Midland Seamless Tube & Steel Co., which planned to act as a holding company until a new organization could be formed. However, no reorganization plans were carried out and the equipment was placed on the market by the Guardian Trust Co., Cleveland, which made the sale. Recently the finishing mill building was sold to the Belfont Iron & Steel Co., Ironton, Ohio.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....1.80c. to 1.90c.
F.o.b. Chicago, base, per lb.....2.10c.

Structural Shapes

F.o.b. Pittsburgh mill, base, per lb.....1.90c. to 2c.
F.o.b. Chicago, base, per lb.....2.10c.

Iron and Steel Bars

Soft steel bars, f.o.b. P'gh mills, base, per lb.....2c.
Soft steel bars, f.o.b. Chicago, base, per lb.....2.10c.
Reinforcing steel bars, f.o.b. P'gh mills, per lb.....2c.
Rail steel bars, f.o.b. Chicago and f.o.b. Chicago district mills, base, per lb.....2.00c.
Common iron bars, f.o.b. Chicago, base, per lb.....1.90c. to 2.00c.
Refined iron bars, f.o.b. P'gh mills, base, per lb.....3.00c.
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

Hot-Rolled Flats

All gages, narrower than 6 in., base per lb., Pitts-
burgh.....2.40c. to 2.50c.
All gages, 6 in. and wider, base per lb., P'gh.....2.20c. to 2.30c.
All gages, 6 in. and narrower, Chicago.....2.50c.
All gages, wider than 6 in., Chicago.....2.60c.
Cotton ties, per 45 lb. bundle, f.o.b. Atlantic ports.....\$1.28
Cotton ties, per 45 lb. bundle, f.o.b. Gulf ports.....1.25

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb.....2.40c.
Screw stock and shafting, f.o.b. Chicago, base, per lb.....2.40c.
Screw stock, base, per lb., Cleveland.....2.45c. to 2.55c.
Shafting, ground, f.o.b. mill, base, per lb.....2.80c. to 3.00c.
Strips, f.o.b. P'gh mills, base, per lb.....3.75c.
Strips, f.o.b. Cleveland mills, base, per lb.....3.75c.
Strips, delivered Chicago, base, per lb.....4.05c.
Strips, f.o.b. Worcester mills, base, per lb.....3.90c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....\$2.60 to \$2.65
Galvanized nails, 1-in. and longer, base plus.....2.00
Galvanized nails, shorter than 1 in., base plus.....2.25
Bright plain wire, base, No. 9 gage, per 100 lb.....2.50
Annealed fence wire, base, per 100 lb.....2.65
Spring wire, base, per 100 lb.....3.50
Galvanized wire, No. 9, base, per 100 lb.....3.10
Galvanized barbed, base, per 100 lb.....3.35
Galvanized staples, base, per keg.....3.35
Painted barbed wire, base, per 100 lb.....3.10
Polished staples, base, per keg.....3.10
Cement coated nails, base, per count keg.....1.85
*Bale ties, carloads, to jobbers...75, 15 and 5 per cent off list
*Bale ties, carloads, to retailers...75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....\$65
Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed (base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh.....2.25c. to 2.40c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills,
2.40c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.10c. to 3.25c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.25c. to 3.35c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh.....4.20c. to 4.40c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....4.35c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.10c. to 3.15c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.25c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh.....4.25c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.60c. to 4.75c.

Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills.....\$5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind.....5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....\$11.20	20-lb. coating I. C.....\$15.50
8-lb. coating I. C.....11.50	25-lb. coating, I. C.....17.00
15-lb. coating I. C.....14.85	30-lb. coating I. C.....18.35
	40-lb. coating, I. C.....20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb.,
\$2.40 to \$2.50
Large, f.o.b. Chicago, base, per 100 lb.....2.60 to 2.65
Small, f.o.b. Pittsburgh.....70, 10 and 5 per cent off list
Small, Cleveland.....70, 10 and 10 per cent off list
Small, Chicago.....70, 10 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....\$43.00
Rails, light, billet, base, per lb.....1.65c. to 1.70c.
Rails, light rail steel, base, per lb.....1.50c. to 1.60c.
Spikes, 1/2 in. and larger, base, per 100 lb.....\$2.80 to \$3.00
Spikes, 1/2 in. and smaller, base, per 100 lb.....3.00 to 3.25
Spikes, boat and barge, base, per 100 lb.....3.25
Track bolts, all sizes, base, per 100 lb.....3.90 to 4.25
Tie plates, per 100 lb.....2.35 to 2.40
Angle bars, base, per 100 lb.....2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
1/2	45	19 1/2	1/2 to 3/4	+11	+39
3/4	51	25 1/2	3/4	22	2
1	56	32 1/2	1 to 1 1/2	28	11
1 1/4	60	48 1/2		30	13
1 to 3	62	50 1/2			

Lap Weld

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends

1/2	41	24 1/2	2 to 3	61	50 1/2
3/4 to 1	47	30 1/2	3/4 to 1	+11	+54
1 1/4	53	42 1/2	1 1/4	21	7
1 1/2	58	47 1/2	1 1/2	28	12
1 to 1 1/2	60	49 1/2	1 to 1 1/2	30	14

Lap Weld, extra strong, plain ends

2	53	42 1/2	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 1/2 point, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 1/2 per cent beyond the above discount.

NOTE—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to 2 1/4 in.....27	1 1/2 in.....+18
2 1/2 to 3 in.....37	1 3/4 to 1 1/2 in.....+8
3 in.....40	2 to 2 1/4 in.....—2
3 1/2 to 3 3/4 in.....42 1/2	2 1/2 to 3 in.....—7
4 to 13 in.....46	3 1/4 to 4 1/2 in.....—9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes Cold Drawn

1 in.....60	3 in.....45
1 1/4 and 1 1/2 in.....52	3 1/4 to 3 1/2 in.....47
1 3/4 in.....36	4 in.....50
2 to 2 1/4 in.....31	4 1/2, 5 and 6 in.....45
2 1/2 and 2 3/4 in.....39	

Hot Rolled

2 and 2 1/4 in.....34	3 1/4 to 3 1/2 in.....50
3 1/2 and 3 3/4 in.....42	4 in.....53
3 in.....48	4 1/2, 5 and 6 in.....48

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing (New List)

Carbon 0.10 to 0.30 base.....50 to 55 per cent off list
Carbon 0.30 to 0.40 base.....45 to 50 per cent off list
Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Prices of Iron and Steel Products and Raw Materials

Ores

<i>Lake Superior Ores, Delivered Lower Lake Ports</i>	
Old range Bessemer, 51.50 per cent iron.....	\$4.55
Old range non-Bessemer, 51½ per cent iron.....	4.40
Mesaba Bessemer, 51.50 per cent iron.....	4.40
Mesaba non-Bessemer, 51.50 per cent iron.....	4.25
High phosphorus iron, 51.50 per cent.....	4.15
<i>Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore</i>	
Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	45c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	\$12.00 to \$13.00
Chrome ore, Indian basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f., Atlantic seaboard...	20.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ New York.....	65c. to 70c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt.....	\$5.00 to \$6.00
Foundry coke, f.o.b. Connellsville prompt.....	5.00 to 6.00
Wine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Atlantic run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.25 to 1.35
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.50

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	115.00
Ferrosilicon, 50 per cent, delivered.....	\$2.50 to \$5.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal.....	1.15 to 1.20
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered.....	11.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, per net ton.....	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$31.00 to \$33.00
Spiegeleisen, domestic, 16 to 19 per cent.....	30.00 to 32.00
Ferrosilicon, Bessemer, 10 per cent, \$33; 11 per cent, \$35; 12 per cent, \$37; electric furnace ferrosilicon, 10 per cent, \$38 furnace; 11 per cent, \$38; 12 per cent, \$38; 14 to 16 per cent, \$45.	
Silvery iron, 6 per cent, \$25.50; 7 per cent, \$26.50; 8 per cent, \$27.50; 9 per cent, \$29; 10 per cent, \$31; 11 per cent, \$33; 12 per cent, \$35.	

Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, gravel, per net ton, f.o.b. Illinois and Kentucky mines.....	\$16.00
No. 2 lump, per net ton.....	19.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton.....	16.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2½ per cent silica, per net ton, f.o.b. Illinois and Kentucky mines.....	32.50
Per 1000 f.o.b. works:	
Fire Clay	
Pennsylvania.....	High Duty \$43.00 to \$46.00 Moderate Duty \$40.00 to \$43.00
Maryland.....	48.00 to 50.00 43.00 to 45.00
Ohio.....	43.00 to 46.00 40.00 to 43.00
Kentucky.....	43.00 to 45.00 40.00 to 43.00
Illinois.....	43.00 to 45.00 40.00 to 43.00
Missouri.....	40.00 to 43.00 35.00 to 38.00
Ground fire clay, per ton.....	6.50 to 7.50
Silica Brick:	
Pennsylvania.....	40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	8.00 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads, .60 and 10 per cent off list	
Machine bolts, all sizes, cut threads, 50, 10 and 10 per cent off list	
Carriage bolts, smaller and shorter, rolled threads, 50, 10 and 10 per cent off list	
Carriage bolts, cut threads, all sizes, 50 and 10 per cent off list	
Eagle carriage bolts.....	.65 and 10 per cent off list
Lag bolts.....	.60, 10 and 10 per cent off list
Plew bolts, Nos. 3 and 7 heads.....	.50 and 10 per cent off list
Other style heads.....	.20 per cent extra

Machine bolts, c.p.c. and t. nuts, ¾ x 4 in.

45, 10 and 5 per cent off list	
Larger and longer sizes.....	45, 10 and 5 per cent off list
Hot-pressed nuts, blank and tapped, square.....	4c. off list
Hot-pressed nuts, blank or tapped, hexagons.....	4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.....	4.10c. off list
Bolt ends with hot pressed nuts.....	.50, 10 and 10 per cent off list
Bolt ends with cold pressed nuts.....	.45, 10 and 5 per cent off list
Washers.....	.650c. to 6.25c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:	
¾ in. and smaller, U. S. S.....	.80, 10 and 5 per cent off list
¾ in. and larger, U. S. S.....	.75, 10 and 5 per cent off list
Small sizes, S. A. E.....	.80, 10, 10 and 5 per cent off list
S. A. E., ¾ in. and larger.....	.75, 10, 10 and 5 per cent off list
Stove bolts in packages.....	.80, 10 and 5 per cent off list
Stove bolts in bulk.....	.80, 10, 5 and 2½ per cent off list
Tire bolts.....	.60 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)
(To jobbers and consumers in large quantities)

Per 100 Net				Per 100 Net			
S. A. E.		U. S. S.		S. A. E.		U. S. S.	
¾-in.....	\$0.44	\$0.44		¾-in.....	\$2.35	\$2.40	
¾-in.....	.615	.615		¾-in.....	3.60	3.60	
¾-in.....	.62	.66		¾-in.....	5.65	5.80	
¾-in.....	.79	.90		¾-in.....	8.90	8.90	
¾-in.....	1.01	1.05		¾-in.....	12.60	13.10	
¾-in.....	1.38	1.42		¾-in.....	18.35	18.35	
¾-in.....	1.70	1.73		¾-in.....	21.00	21.00	

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws.....	.80, 10 and 5 per cent off list
Milled standard set screws, case hardened.....	80 and 10 per cent off list
Milled headless set screws, cut thread.....	80 and 10 per cent off list
Upset hex. head cap screws, U. S. S. Thread.....	80, 10, 10 and 5 per cent off list
Upset hex. cap screws, S. A. E. Thread.....	80, 10 and 5 per cent off list
Upset set screws.....	80, 10 and 10 per cent off list
Milled studs.....	.75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$33.50 to \$35.00
Forging billets, ordinary.....	40.00
Forging billets, guaranteed.....	45.00
Sheet bars.....	\$33.50 to 35.00
Slabs.....	\$33.50 to 35.00
Wire rods, common soft, base, No. 5 to ¾-in.....	45.00
Wire rods, common soft, coarser than ¾-in.....	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	1.90c.
Skelp, sheared, per lb.....	1.90c.
Skelp, universal, per lb.....	1.90c.

*Chicago mill base is \$46. Cleveland mill base, \$45.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Numbers	Bars 100 lb
2100*	(½% Nickel, 10 to 20 per cent Carbon)	3.25 to 3.50	
2300	(3% Nickel)	4.50 to 4.75	
2500	(5% Nickel)	5.80 to 6.25	
3100	(Nickel Chromium)	3.50 to 3.65	
3200	(Nickel Chromium)	5.25 to 5.50	
3300	(Nickel Chromium)	7.30 to 7.75	
3400	(Nickel Chromium)	6.50 to 6.75	
5100	(Chromium Steel)	3.25 to 3.60	
5200*	(Chromium Steel)	7.50 to 8.25	
6100	(Chromium Vanadium bars)	4.25 to 4.50	
6100	(Chromium Vanadium spring steel)	3.85 to 4.00	
9250	(Silicon Manganese spring steel)	3.25 to 3.50	
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)		4.10 to 4.35	
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)		4.50 to 4.60	
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)		4.25 to 4.45	
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)		3.60 to 3.75	
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)		4.75 to 5.00	

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

BUY ROGERS-BROWN MINE

M. A. Hanna Co. Syndicate Acquiring Susquehanna Property at Hibbing

CLEVELAND, Oct. 13.—Negotiations for the sale of the Susquehanna iron mine at Hibbing, Minn., owned by the Rogers-Brown Iron Co., Buffalo, to a syndicate formed by the M. A. Hanna Co., Cleveland, are under way and are expected to be concluded this week. There have been reports that the Rogers-Brown Iron Co. was to be acquired, but it is announced that the company's furnaces in Buffalo are not included in the proposed sale. However, if the deal goes through it will represent a substantial readjustment of the affairs of the Rogers-Brown Iron Co.

Some large ore consumers will be associated with the M. A. Hanna Co. in the purchase of the Susquehanna mine. It is understood that before the deal can be finally closed the consent to a release for sale of certain of its properties will have to be obtained from the Rogers-Brown Iron Co.'s general mortgage bondholders. The Susquehanna mine is one of the large open pit mines on the Mesabi Range. It was opened in 1906 and has shipped 7,500,000 tons of ore. The amount remaining in the mine is estimated in excess of 15,000,000 tons of both Bessemer and non-Bessemer grades. For several years the property has made only a moderate output but it is expected with the change in ownership and management that the equipment will be modernized and shipments greatly increased. The names of the M. A. Hanna Co.'s associates in the proposed purchase have not been announced.

OPEN-HEARTH MEN MEET

Three-Day Session in Cleveland Opened on Tuesday

CLEVELAND, Oct. 13.—Superintendents of open-hearth steel plants to the number of 45 began a three-day meeting here today following visits yesterday of the open-hearth departments at Youngstown of the Youngstown and Republic companies. Today's discussions went into intimate details of design and some points of practice of furnaces burning oil, tar, producer and by-product gas, covering proportions and shapes of roofs, ports, slag pockets, checkers and the like. E. A. Whitworth, recently of the Bourne-Fuller Co. and now of the Gathmann Engineering Works, presided and L. B. Lindermuth, Carney & Lindermuth, was secretary. John V. W. Reynnders, president of the American Institute of Mining and Metallurgical Engineers, made the opening address.

The meeting owes its inception to the organizing of open-hearth superintendents at a meeting of the institute April 16 at Pittsburgh. The subject of design was introduced by G. D. Trainter, open-hearth superintendent American Rolling Mill Co., Middletown, Ohio, and among those taking conspicuous part were Kenneth C. McCutcheon, open-hearth superintendent American Rolling Mill Co., at Ashland, Ky.; James J. Bowden, chief metallurgist Laclede Steel Co., at Alton, Ill.; Carl W. Peirce, open-hearth superintendent Mansfield Sheet & Tin Plate Co.; W. E. Buck, metallurgist National Enameling & Stamping Co.; W. A. Maxwell, Jr., general superintendent Inland Steel Co.; Kent Harrison, Donner Steel Co.; C. B. Collingwood, superintendent of open-hearth and rolling mills Stanley Works, New Britain, Conn., and James R. Stuart, open-hearth superintendent Colorado Fuel & Iron Co., Pueblo, Colo.

The Air Reduction Sales Co. has sent letters to industrial and railway users of the oxyacetylene processes, in regard to oxygen made by a process utilizing the apparatus of the Messer and Heylandt types manufactured in Germany. It has notified them of intention to enforce rights under patents regarded as infringed upon by the German apparatus.

RAILROAD EQUIPMENT

Pennsylvania Orders 6000 Cars Repaired—Over 12,000 Cars Pending

The Pennsylvania Railroad has ordered repairs to 6000 hopper cars, requiring 60,000 tons of steel. New cars which may be bought total close to 12,500, including 5000 talked of for the Santa Fe, 3000 which the New York Central has authorization for, 2200 for the Missouri Pacific, 1000 for the International-Great Northern, 750 for the Denver & Rio Grande Western and 500 for the Missouri-Kansas-Texas. Locomotive orders include 10 for the New Haven road, 7 for Brazil and 10 electric engines for Chile. The principal items of the week follow:

The Pennsylvania Railroad has placed contracts for the repair of 6000 steel hopper cars, involving about 60,000 tons of steel. The order was divided as follows: Ralston Steel Car Co., 3000; Youngstown Steel Car Co., Greenville Steel Car Co. and Buffalo Steel Car Co., 1000 each.

It is reported in the trade that the Santa Fe will soon come into the market for 5000 cars.

The New York Central Railroad, which as reported last week has inquired for 1000 all-steel box cars, has authorization for 3000 and may purchase that number. Bids close Oct. 20.

The New York, New Haven & Hartford Railroad has ordered 10 locomotives from the American Locomotive Co.

The Chicago, South Shore & South Bend has contracted with the Pullman Car & Mfg. Co. for 25 motor cars.

The Cuban Railways have ordered 275 box cars from the American Car & Foundry Co.

The Illinois Central has placed 200 flat cars with the Standard Steel Car Co.

Denver & Rio Grande Western is inquiring for 500 gondolas, 250 automobile cars and 10 mountain type passenger locomotives.

The Kansas City, Mexico & Orient has inquired for 20 box cars.

The Missouri-Kansas-Texas has entered the market for 500 automobile cars.

The Missouri Pacific has authorized purchase of 1500 box, 200 40-ton automobile, 250 50-ton automobile and 250 hopper cars.

It is reported that 1000 automobile and box cars will be purchased for the International & Great Northern.

The Richmondale Coal Co. has ordered 25 mine cars from the American Car & Foundry Co.

The Continental Coal Co. has ordered 150 mine cars from the American Car & Foundry Co.

The Chile Exploration Co. has ordered 100 ore cars from the Pressed Steel Car Co.

The Baldwin Locomotive Works has received orders for 7 steam locomotives from Brazil and for 10 electric locomotives from Chile.

Want Commodity Rates on Steel in Official Classification Territory

A separate hearing on iron and steel products, with the object in view of assigning to them commodity instead of class rates, was urged by witnesses who recently testified before Howard Hosmer, examiner, Interstate Commerce Commission, at Chicago, on the carriers' proposal for a revision of class rates in Official Classification territory.

In supporting the proposed change to a commodity rate basis, L. C. Behler, traffic representative for the various subsidiary companies of the United States Steel Corporation, said:

"For many years, iron and steel carload rates were made on the grouping and differential basis. We continue to favor the making of iron and steel carload rates on a reasonable differential basis over and under main producing districts, and we are in favor of the retention of the present differentials. We also favor one basic level of rates in the Official territory, which also should apply to and from Virginia cities.

"We believe that a class rate adjustment in the Official territory, influenced by consideration of the proper rates for iron and steel articles, or a class rate adjustment predicated on fifth class, presumably because of the large volume of iron and steel moved on fifth class, will produce a rate structure highly unsatisfactory both as to the class rates and the rates on iron and steel."

PERSONAL

Frank C. Carter, for many years connected with the Alan Wood, Iron & Steel Co., Philadelphia, has become associated with the Central Iron & Steel Co., Harrisburg, Pa., as salesman.

Joseph N. Shenstone has been elected president of the Massey-Harris Co., Toronto, Ont., to succeed Hon. Vincent Massey, who has retired to enter the King government cabinet as a Minister without portfolio. Mr. Shenstone has been associated with the Massey-Harris Co. for about forty years and was vice-president and chairman of the Board of Directors. Thomas Bradshaw, general manager of the Massey-Harris Co., becomes vice-president and general manager.

Joseph G. Butler, Jr., veteran iron and steel maker of the Mahoning Valley, whose eighty-fifth birthday anniversary comes in December, is enjoying fairly good health and is able each day to motor from Youngstown to nearby points. Mr. Butler evinces keen interest in the civic affairs of his community and his advice on public questions is frequently sought.

George R. Doughty, for the past fifteen years assistant sales manager of the Republic Iron & Steel Co., Cleveland, has been appointed manager of sales of the Mill & Mine Supply Co., Akron.

Edward D. Kilburn has been elected a vice-president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Alfred M. Bissikummer, assistant superintendent, machine department, American Locomotive Co., Dunkirk, N. Y., and for twenty-eight years identified with that company, has resigned and moved to Erie, Pa.

John Berg was guest of honor at a dinner given on Sept. 10 by the Metal Specialties Manufacturing Co., 338 North Kedzie Avenue, Chicago. Having reached his sixtieth birthday Mr. Berg was retiring from active service in the company. He will continue in an advisory capacity as a director and vice-president. He came to this country in 1890 and two years later started in business with a total capital of \$3.65. In 1902 he became associated with J. H. Lee and L. W. Golder. At that time the company was given its present name and a short time later it was incorporated.

M. M. Mossman has been appointed sales agent in Seattle for the Columbia Steel Corporation, San Francisco, with an office in the L. C. Smith Bldg., Seattle.

A. C. Denman, president Southern California Iron & Steel Co., Los Angeles, a subsidiary of the Pacific Coast Steel Co., San Francisco, has resigned, and E. S. Houdlette, sales director Pacific Coast Steel Co., has been elected vice-president in charge of sales of the Los Angeles concern. No president has yet been elected to succeed Mr. Denman.

L. S. Perego, secretary Sivy Steel Casting Co., Milwaukee, was elected second vice-president to succeed Donald Fraser, at the recent annual meeting of the company.

J. S. Nachtman has resigned his connection with the John A. Roebling's Sons Co., Trenton, N. J., and becomes assistant general sales manager of the Stanford Steel Corporation, Milford, Conn.

Henry E. C. Hill has succeeded Thomas E. Salmon, Jr., as purchasing agent of the North & Judd Mfg. Co., New Britain, Conn.

Henry A. Taubensee, in charge of the Chicago office Superior Sheet Steel Co., Canton, Ohio, has been ap-

pointed general manager of sales for the company. He was formerly connected with the Canton Art Metal Co., and the Massillon Rolling Co.

Thomas H. Rogers, superintendent Follansbee, W. Va., plant, Follansbee Brothers Co., Pittsburgh, since it was built 21 years ago has resigned. He dates his connection with the steel industry back to the early days of tin-plate making in the United States. He started with Rogers & Burchfield at Leechburg, Pa., which failed in 1874 because it could not produce tin plate profitably in competition with British manufacturers. He then went with the Bay State Iron Co., Boston, remaining there until 1885, when he became associated in an operating capacity with Wallace, Banfield & Co., operating a sheet mill at Irondale, Ohio, which with the advent of a protective tariff on tin plate in 1890 was converted into a tin plate mill. This plant was acquired by the American Tin Plate Co. in 1898 and Mr. Rogers continued at the plant under that ownership until it was abandoned in 1900. He later joined the Follansbee Brothers Co. and with the completion of its plant at Follansbee, W. Va., in 1904 he was appointed superintendent.

J. M. Robinson, formerly manager of the Grand Rapids, Mich., office of the Lincoln Electric Co., Cleveland, has been transferred to Detroit in charge of that territory.

G. W. First has been transferred from the Boston office of the Lincoln Electric Co., Cleveland, to the Grand Rapids territory. J. E. Durstine of the same company goes from the Chicago to the Buffalo office.

John R. Clymer, manager of the northern division of the California Institute of Steel Construction; Benjamin P. Harwood, vice-president, Llewellyn Iron Works, Los Angeles, and Fred Brombacher, of the Brombacher Iron Works, Los Angeles, will be the official delegates of the steel fabricators of California at the annual convention of the American Institute of Steel Construction at White Sulphur Springs, W. Va., Nov. 11-14. Mr. Clymer is one of the speakers at the meeting, having the Santa Barbara earthquake and the part structural steel played in it as his topic.

E. J. Kulas, president Otis Steel Co., Cleveland, sailed Oct. 9 for a short trip to Europe.

OBITUARY

FRED E. BRIGHT, inventor and manufacturer, and for several years president of the Hess-Bright Mfg. Co., Philadelphia, died last week at the home of a sister in Greenwich, Conn. His first inventions were related to typesetting machines. He helped to organize the Hess-Bright company in 1904 and from 1912 to 1916, when he retired, was its president. He was a member of the American Society of Mechanical Engineers, the Cleveland Engineering Society, the Royal Society of Arts in London and other organizations. His wife and four sisters and a brother, H. V. Bright, survive. The funeral was held on Saturday in New York.

CHARLES F. GREEN, chief chemist and assistant treasurer, Henry Souther Engineering Co., Hartford, Conn., died at the Hartford hospital, Oct. 11 following an operation for appendicitis. Mr. Green entered the employ of the Henry Souther Engineering Co. shortly after graduating from the University of Pennsylvania in 1914, and after practical service in foundries and brass mills, became chief chemist in 1918 and assistant treasurer in 1923. He was a member of the American Chemical Society, American Society for Steel Treating and the Hartford Engineers Club.

MRS. CATHERINE CONROY, president of the Conroy

Boiler & Tank Works, Chicago, was killed Oct. 5 when struck by a Pennsylvania Railroad freight train at Forty-seventh and Leavitt Streets. Mrs. Conroy assumed control of the boiler works some months ago after her husband, who was president, died.

PETER WASSNER, age 51, foreman, Batavia Foundry Co., Batavia, Ohio, died in a Cincinnati hospital Oct. 4, as the result of an automobile accident the preceding day.

JOHN A. MONAHAN, vice-president and chief engineer, Filer & Stowell Co., Milwaukee, and nationally known authority on sawmill construction, design and equipment, died suddenly at San Francisco on Oct. 6 while on a business tour of the Pacific coast. He was born in East Troy, Wis., in 1871, and was a graduate of the College of Engineering, University of Wisconsin, becoming associated with the Filer & Stowell Co. at once. His brother, James L. Monahan, is president of the company.

J. W. GRACE, father of Eugene G. Grace, president of the Bethlehem Steel Corporation, died in Jefferson Hospital, Philadelphia, Oct. 12. Mr. Grace, who was 82 years of age, had been under treatment in the hospital since last March.

INDIAN PIG IRON IMPORTS

Countervailing Duty Not Likely, as India's Bounty Is on Steel

WASHINGTON, Oct. 13.—Doubt exists that the United States Government can apply countervailing duties on imports of pig iron from India. The subject is under inquiry as a result of a communication received by the Customs Division, Treasury Department, from eastern Pennsylvania merchant pig iron producers. They have called the attention of the division to reports published by the Department of Commerce that the Indian legislature recently declared a bounty of 12 rupees, equivalent to approximately \$4.32 per ton of steel ingots produced in India.

The first report received was that the bounty was to apply to 70 per cent of the production. The report as received after the legislature had acted did not make it clear whether it applied to this per cent or to all of the production. In case it relates to only 70 per cent the bounty would be equivalent to about \$3 per ton.

The report says specifically that the duty applies to steel and not to pig iron. The countervailing provision of the tariff law, known as section 303, provides that when any country grants a bounty upon the manufacture or production or export of any article or merchandise, the United States shall levy, besides the regular duty, an additional duty equal to the net amount of such bounty or grant, "however the same be paid or bestowed." This may be done whether the article is imported in the same condition as when exported from the country of production or has been changed in condition by remanufacture. However, it has been pointed out that this country receives no imports of steel from India and that therefore there is no basis for applying the countervailing duty to pig iron. It is understood that if it were found that there are imports of steel from India the customs division would be required to ascertain the amount of pig iron represented in the tonnage imported. The customs division has asked the State Department to make inquiry through the Consul General at Calcutta, the Treasury Department having no agent in India.

General Electric Co. orders received for the three months ended Sept. 30 amounted to \$73,561,483, compared with \$58,389,832 for the same quarter in 1924, an increase of 26 per cent. For the nine months of the present year, orders total \$223,876,711, compared with \$203,097,719 for the first nine months of 1924, an increase of 10 per cent.

CANADIAN SCRAP ACTIVE

Steel Mills Operating on Large Rail Orders Are Melting More Material

TORONTO, ONT., Oct. 12.—During the past two or three weeks general improvement has featured the demand for iron and steel scrap in the Canadian market. While some consumers have closed for last quarter needs, the greater part of current sales are for spot delivery. Melters are entering the market for larger tonnages than formerly and are laying in stocks to replenish depleted holdings. Canadian dealers also report a stronger demand for old material on export account, especially from United States buyers. While the demand for scrap has improved, there has been practically no change in the daily melt of foundries. Steel mills, however, in most cases are running close to capacity and scrap requirements are increasing. The mills in the Hamilton, Ont., district are buying in larger quantities and are entering the market at more frequent intervals than formerly.

The stronger demand for scrap on resale account has stimulated trading between dealers. During the past week or two, dealers in both the Toronto and Montreal markets have been in the market for material and a greater volume of scrap has changed hands than for any corresponding period in the past six months. The improved conditions in this market have resulted in advances in dealers' buying prices on some commodities ranging from 50c. to \$1 per ton in both the Montreal and Toronto districts.

The placing of steel orders by the Canadian National and Canadian Pacific railroads is accountable for the greater part of recent improved conditions in the Canadian market. The Algoma Steel Corporation, Sault Ste. Marie, Ont., which has orders for steel rails calling for upwards of 60,000 tons, has already started its rail mill on double shift and is increasing production in other departments as well. The British Empire Steel Corporation, Sydney, N. S., has contracts for a like amount and its rail mill is now running on an 18,000-ton order for the Canadian Pacific Railway. The Steel Co. of Canada, Hamilton, Ont., has shared in orders for spikes, tie plates, etc., and is running at about 65 per cent in all departments.

At the present time there are five blast furnaces blowing out of 16 in the Dominion on the list of the Dominion Bureau of Statistics. The furnaces in blast are as follows: British Empire Steel Corporation, Sydney, N. S., two; Algoma Steel Corporation, Sault Ste. Marie, Ont., two, and the Steel Co. of Canada, Ltd., Hamilton, Ont., one. The latter company is making repairs and relining its second blast furnace, which will be blown in as the demand for pig iron makes this step necessary. Of the five furnaces blowing two are running continually on basic iron and two on foundry and malleable, while the stack at Hamilton, Ont., is running in turn on foundry, malleable and basic.

Dealers' iron and steel scrap buying prices are as follows:

	Per Gross Ton	
	Toronto	Montreal
Steel turnings	\$10.00	\$9.00
Machine shop turnings.....	10.00	9.00
Wrought pipe	8.00	8.00
Rails	12.00	13.00
No. 1 wrought	13.00	13.00
Heavy melting steel	11.00	11.00
Steel axles	17.00	18.00
Axles, wrought iron	18.00	20.00
	Per Net Ton	
Standard car wheels	16.00	15.00
Malleable scrap	14.00	14.00
Stove plate	13.00	13.00
No. 1 machinery cast	17.00	16.00

The American Iron Works has been incorporated in Birmingham for \$100,000 to manufacture railroad and industrial forgings, balconies, brackets and canopies. G. C. Illingsworth is president, and W. H. Daniels of the Daniels Ornamental Iron and Wire Corporation is associated with him. The new corporation has bought the plant of the North Birmingham Forge Co., known as the Preston Motor Co., plant No. 2.

Ferric Oxide in Steel Making

(Concluded from page 1031)

It is noteworthy that the metallic iron held in suspension by a basic slag, even with a vigorous boil, is much less than in an acid slag under similar conditions. The absence of these metal globules may partly account for the greater proportion of Fe_2O_3 present, while another reason is to be found in the basic character of the slag. Owing to the presence of CaO , MgO , and MnO in excess of that required to satisfy the demands of the acids, much of the FeO must exist in the uncombined state, and, as a consequence, it will be more readily oxidized by the gases.

In view of the relatively large percentage of Fe_2O_3 carried by a basic slag, a very considerable amount of gas-oxidation is to be expected, if the explanation of the action of Fe_2O_3 outlined above is correct. Ample data could be given to show that such is indeed the case. An example is seen in the series of analyses just given, for no further addition of ore or scale was made after sample No. 5 was taken; only a little lime and 30 cwt. of pig iron were added. Yet the iron increased from 9.7 to 11.3 per cent, equivalent to a loss in yield of 4.0 cwt. If the pig iron had not been added the loss would, of course, have been greater; in fact, it is possible to lose, in a 60-ton furnace, as much as 8.0 cwt. per hr., under favorable circumstances, by gas-oxidation.

Here also, therefore, the Fe_2O_3 must act as a carrier of oxygen and the greater oxidizing power of a basic slag as compared with an acid may thus be explained as being due to the activity of its larger Fe_2O_3 content. Even when the iron is as low as 5 per cent a fairly vigorous boil can be maintained.

It was noticed, in comparing the Fe_2O_3 content of a number of finishing slags, that a definite relationship appeared to exist between the percentage of the two acids SiO_2 and P_2O_5 and that of the Fe_2O_3 . By plotting the latter as ordinates and the molecular percentage of the former as abscissæ a curve was obtained. Although some of the points did not lie very close to the curve, the general trend of the results is unmistakable and it accordingly seems permissible to conclude that the basicity of the slag is a factor upon which the Fe_2O_3 content largely depends. This inference is in agreement with an observation first made by McCance who showed that, in certain siliceous mill-cinders, the percentage of Fe_2O_3 decreased with an increasing SiO_2 content. Whiteley and Hallimond also arrived at the same conclusion from the examination of experimental melts of the two substances in different proportions. The somewhat variable nature of the results plotted in the graph may, at first sight, be regarded as unsatisfactory, but when account is taken both of the difficulties met with in analysis and deviations due to bath conditions, as discussed below, it will be readily understood that the attainment of more exact values is scarcely possible.

Difficulties in Analysis

The Fe_2O_3 content was in all cases arrived at as usual from the difference between the total iron and the ferrous iron, but a very accurate determination in this way does not seem possible with basic slags for the following reasons:

(1) In taking the sample, a spoonful of the slag was withdrawn from the furnace and allowed to cool. A small piece was reserved from the lower portion of each sample for the estimation of the Fe_2O_3 and the remainder prepared for the complete analysis. This procedure was adopted in order to avoid any error in the Fe_2O_3 result due to oxidation by the air of the surface of the sample as it cooled. Unfortunately, in thus avoiding one error, another was probably introduced, for it was found that, unlike similar acid slags, the composition of these basic slags was not uniform throughout. A typical example of the variation in the percentages of the iron oxides at the different parts is given below, from which it is clear that the Fe_2O_3 found in the bottom part is not quite representative of the whole.

	Fe_2O_3	FeO
Top	3.4	7.9 per cent
Spongy center.	2.6	6.7 per cent
Bottom	2.6	8.2 per cent

(2) The presence of sulphides in these slags may also affect the accuracy of the Fe_2O_3 determination owing to a slight reduction of the ferric chloride by the sulphuretted hydrogen liberated when the sample is treated with hydrochloric acid. On the other hand, it seems possible, especially in slags having a high manganese content, that a little Mn_2O_3 may be present and this would cause a small error in the opposite direction, due to the oxidation of ferrous chloride.

Another difficulty is encountered in the estimation of the SiO_2 . The use of appreciable amounts of fluor spar in the furnace as a flux probably affects the result through the formation of volatile SiF_4 as the sample dissolves. This loss will account for the fact that, in making a complete analysis of such slags, the total of the results obtained seldom reaches 99 per cent. Unfortunately no very satisfactory method of estimating the fluorine has yet been devised.

Variable Bath Conditions

In all the instances plotted a more or less vigorous boil was proceeding when the sample was taken. It does not seem possible, in the basic process, to obtain a really quiet bath, as in the acid, at the finishing stage. Now there is evidence to show that, among other things, the quantity of CO passing through the slag has a marked effect upon its Fe_2O_3 content. For example, two samples were taken from a bath which near the door was perfectly quiet owing to breast erosion, while further in a strong boil was in progress.

Analysis:	No. 1. Near door Per cent	No. 2. Within Per cent
FeO	4.4	5.8
Fe_2O_3	2.9	0.7
SiO_2	21.4 = 0.39 mol.	23.1 = 0.385 mol.
MnO	5.7	5.8
CaO	49.6	47.1
MgO	7.34	7.38
P_2O_5	5.51 = 0.039 mol.	6.18 = 0.043 mol.

The lower percentage of Fe_2O_3 in No. 2 sample must clearly be set down to the activity of the bath, and it will be noticed that the point given by this sample on the graph lies closer to the curve than that of No. 1. In any particular slag, the actual amount of Fe_2O_3 present will therefore depend upon the velocity of the carbon reaction at the time of sampling and this, of course, varied to some extent in the instances plotted.

Besides the quantity of CO passing through the slag there are other bath conditions which may have an influence on the actual amount of Fe_2O_3 present. Among these may be mentioned temperature, slag viscosity and iron content, as well as the volume of air used to burn the gases in the furnace. A further point should here be noted, namely, that the amount of base required to satisfy a molecule of each acid may not be the same. For example, the compound $2\text{CaO} \cdot \text{SiO}_2$ may be formed in one case and $3\text{CaO} \cdot \text{P}_2\text{O}_5$ in the other. Hence we may have two slags with equal molecular proportions of acids but unequal basicity.

It is thus clear from a consideration of these various factors that a close agreement among the results is not to be expected; in fact, the conclusion that the Fe_2O_3 increases with the basicity would appear justifiable even with a still wider divergence of the points.

It follows from the above conclusion that the amount of gas-oxidation should also increase with the basicity, if, as is here contended, gas-oxidation is facilitated by the presence in the slag of Fe_2O_3 . On this point the author is unable to give any very definite information, but it is certainly a fact that, when a highly basic slag is used, the charge can be worked to a finish, from a fairly high carbon content, without the use of either ore or scale. In this connection, however, the possibility must not be overlooked that a compound of Fe_2O_3 with CaO may be formed, as suggested by Bainbridge, in quantities depending upon the amount of free CaO available. The fixation of a certain proportion of the Fe_2O_3 in this way would, of course, change the equilibrium conditions in the manner indicated by the shape of the curve, but at the same time it might retard the increase in gas-oxidation.

Increasing Wire-Drawing Speed

(Concluded from page 1029)

constant, and that logic and experience bearing on this point are absolutely correct.

This interesting formula, while theoretically accurate and universally applicable, is, of course, of small practical value as an operating tool. It is subject to discount for poor steel, poor cleaning, poor dies, and in fact any of the usual wire mill casualties. It would be hopelessly complicated by "throwing off" wire at intermediate sizes, and will be subject to discount by the "fatigue factor" of the individual. Its real value lies in the fact that it reveals the fundamentals on which alone logical processes of thought can be based. Fallacies such as the reputed relationship between high speed and low labor cost fall away, and the proper points of attack are revealed.

MW

The value of the expression $\frac{MW}{T+P+B}$ can be

raised by increasing the numerator or decreasing the denominator. M cannot be materially changed. W has long been stationary at 300 lb. This formula expresses what has frequently been proved in practice, namely, that, other things being equal, output per man increases directly with increased weight of the bundle. Six-hundred-pound bundles, provided they did not increase the time of the non-productive operations, would double the output per man.

Cutting Down Time for Chores

The formula expresses also the obvious fact that output per man increases as the time of chores is cut down, and it proves further that cutting down a chore is equally fruitful in increasing output per man, whether that chore is one which lengthens the cycle or not.

Other interesting facts can be obtained from the two basic formulas, the equations for N and Q :

1. *A decrease in the time required for any chore increases the number of units operable per man and also the yield per unit. The resulting increase in output per man, with due regard for the relative values of interest and direct labor, greatly outweighs the increase in investment.*

2. *A chore which increases the length of the cycle better repays attention than any other, for the shortening of such a chore increases output and at the same time reduces investment.*

3. *The shifting of a chore out of the cycle does not affect output, but decreases investment.*

Having developed these formulas, the writer's first thought was to see how they accounted for the fact that continuous drawing (for example, "four-draft work"), when so conducted as to be otherwise satisfactory, raises output per man by about 60 per cent as compared with single drafting. The answer is found in the terms below the line. Stripping is done once instead of four times. Pointing is done once or twice instead of four times. Threading (starting the draft) is done the same number of times, but it is probable that four such operations in quick succession as a single chore will always be faster than four separate operations at irregular intervals.

These gains, however, are not sufficient to account for the great discrepancy in output per man. A much larger gain is the elimination of the "fatigue factor." In single hole production there must be added to the chores in the denominator of the formula the amount of idle time claimed by the wire drawer for recuperation from the strain of stripping the blocks. This is a heavy handicap, and even mechanical stripping has thus far failed to affect it. In continuous drawing there is nothing from which to recuperate, and the

wire drawer falls quite readily into an operating cycle in which practically his whole time is taken up with chores.

Advantages of Continuous Drawing

Essentially, then, continuous drawing of coarse sizes succeeds by making it easy for a man to run two four-block machines as four or five single blocks. This conclusion checks pretty well with the well known fact that, when a good wire drawer of unusual physique can be induced to go out after a record, he will run eight blocks instead of the usual five, and produce in a day approximately the output of two four-block continuous machines.

In drawing practical conclusions from these formulas, care must be taken to give due weight to such factors as:

Rapid multiplying of die troubles and wire breakage with increase of speed.

The fact that a man cannot operate a fraction of a machine and that, consequently, a raising of speed to round out an operating cycle may be justified in output.

The writer feels justified in publishing the following conclusions:

1. *High speed, of itself, does not increase output per man.*

2. *Both individual motor drive and mechanical stripping have undeniable advantages, but these are difficult to trace into the cost sheets.*

3. *Continuous drawing (and in this term is included "double-deck" drawing) is the most promising development in sight.*

4. *Other things being equal, the most effective continuous machine is that in which non-productive operations are not only reduced in time as far as possible, but to the greatest possible extent shifted out of the cycle.*

FEWER AUTOMOBILES MADE

August Drops Heavily from July—Eight Months Show New High Record

WASHINGTON, Oct. 9.—Production of motor vehicles in August is reported by the Department of Commerce at 221,756 passenger cars and 37,643 trucks, of which 7430 passenger cars and 1436 trucks were produced in Canada. The total was 259,399. This is a sharp drop under July, when production amounted to 357,883 passenger cars and 41,748 trucks, a total of 399,631. For the eight months ended with August of the present year production of passenger cars totaled 2,516,339, against 2,351,913 passenger cars for the corresponding period of last year. Production of trucks during the eight months of the current year totaled 316,213, against 257,462 for eight months in 1924.

Compared with 1923, when the high record production was reached, 1925 shows a gain of 3 per cent in number of passenger cars and of 21 per cent in trucks. The 1923 figures for eight months were 2,442,800 passenger cars and 261,741 trucks, a total of 2,704,541 vehicles. The total in eight months of this year has been 2,832,552, against 2,609,375 last year.

A recent addition to the line of products of the American Steel Co., Ellwood City, Pa., is an extended prong cotter pin, which is being sold to the trade under the trade name of Kelkotters. This is a form of cotter pin that has found extensive use by automobile builders. The advantage claimed for the extended prong cotter pin is that it can be spread by a hammer or any other handy implement without recourse to special spreading tools.

Fifteen hundred tons of rail steel reinforcing bars will be utilized in the construction of a group of nine buildings for the School of Medicine, University of Chicago, Chicago. The cost of the group will be nearly \$5,000,000.

Where Steel Exports Went in August

Canada Took 228,659 Tons of Nine Leading Items in Eight Months—Japan Third with 49,506 Tons, Following Cuba, 56,189 Tons—Argentina Took 46,923 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	August		Eight Months Ended August		August		Eight Months Ended August		August		Eight Months Ended August	
	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924
Total	9,576	5,344	69,396	61,984	10,985	7,001	109,696	66,929	9,374	11,060	53,787	99,665
Canada	8,151	2,332	53,503	47,879	1,939	1,381	17,929	12,392	3,940	2,248	28,843	26,292
Japan .....	.....	109	879	285	564	249	2,629	10,230	3,666	7,070	16,854	65,655
Cuba	494	80	862	823	1,358	1,297	7,173	6,575	297	119	868	676
Philippine Islands..	2	.....	151	917	677	595	12,066	9,560	20	46	127	598
Mexico	30	43	879	483	.....	479	4,773	3,661	.....	.....	.....	.....
Argentina	476	*534	.....	*1,320	938	378	33,657	4,313	333	149	690	1,059
Chile .....	.....	.....	.....	.....	29	262	1,493	1,006	.....	.....	.....	.....
Colombia .....	.....	.....	.....	.....	863	375	4,114	2,299	.....	.....	.....	.....
Central America....	.....	.....	.....	.....	.....	516	.....	3,096	.....	.....	.....	.....

*All South America

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	August		Eight Months Ended August		August		Eight Months Ended August		August		Eight Months Ended August	
	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924
Total	25,468	18,006	121,222	139,230	5,044	8,874	48,335	60,257	3,034	2,493	25,075	29,139
Canada	2,797	257	14,275	13,481	44	20	1,327	619	1,149	467	10,170	6,445
Japan	577	1,294	4,532	31,663	.....	.....	.....	.....	169	20	602	3,790
Cuba	5,478	5,626	29,923	28,414	362	978	3,381	5,570	153	11	1,698	1,187
Philippine Islands..	.....	1,419	2,215	4,329	.....	.....	773	.....	.....	.....	.....	.....
Mexico	87	281	3,978	7,606	192	438	4,115	2,538	623	437	2,893	2,565
Argentina .....	.....	.....	.....	.....	965	1,406	6,565	7,115	61	257	548	8,527
Chile	384	1,721	4,734	8,610	.....	.....	.....	.....	1	.....	104	.....
Colombia	730	1,885	1,621	7,906	556	613	3,420	4,516	.....	.....	.....	.....
Brazil	3,227	202	5,755	8,348	884	3,403	11,501	20,867	217	382	1,685	2,800
Chosen	54	250	.....	36	.....	.....	.....	.....	.....	.....	.....	.....
Honduras .....	.....	.....	1,182	2,627	.....	.....	.....	.....	.....	.....	.....	.....
Kwan Tung .....	.....	.....	.....	10,985	.....	.....	.....	.....	.....	.....	.....	.....
Australia .....	.....	.....	.....	.....	52	165	765	1,960	.....	113	.....	1,602
British S. Africa..	.....	.....	.....	.....	247	268	3,746	3,740	.....	.....	.....	.....
Great Britain.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	1,169

	Tin Plate				Plain Heavy Structural Steel				Steel Bars			
	August		Eight Months Ended August		August		Eight Months Ended August		August		Eight Months Ended August	
	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924
Total	12,402	6,656	101,099	112,808	11,170	13,778	61,065	78,652	10,599	7,389	73,596	72,512
Canada	2,965	1,910	23,386	16,420	9,081	.....	39,135	.....	5,551	.....	40,091	.....
Japan	3,000	1,526	22,162	25,100	23	.....	973	.....	73	.....	875	.....
Cuba	206	426	3,206	3,584	1,005	.....	4,981	.....	927	.....	4,097	.....
Mexico	518	496	4,046	2,751	.....	.....	.....	.....	.....	.....	.....	.....
Argentina	466	281	4,987	6,748	.....	.....	.....	.....	.....	.....	.....	.....
Chile	402	291	3,573	1,757	308	.....	1,601	.....	.....	.....	.....	.....
China	1,313	50	8,366	22,984	.....	.....	.....	.....	.....	.....	.....	.....
British India .....	.....	245	.....	9,304	.....	.....	.....	.....	.....	.....	.....	.....
Hong Kong .....	.....	174	.....	6,325	.....	.....	.....	.....	.....	.....	.....	.....
Italy	91	244	4,919	3,939	.....	.....	.....	.....	.....	.....	.....	.....

Pig Iron Rate Reductions Opposed by Northern Producers

WASHINGTON, Oct. 10.—Proposed reductions in rates on pig iron from Birmingham and other Southern producing points to Ohio River crossings and other Northern destinations have been supported in briefs filed with the Interstate Commerce Commission by the Iron and Steel Conference of Birmingham, the Central Iron & Coal Co., the Republic Iron & Steel Co., at Birmingham, the Sloss-Sheffield Steel & Iron Co., and the Woodward Iron Co. At present the lower rates are under suspension. Northern pig iron producers oppose the rates with equal vigor.

Southern interests say that 90 per cent of the pig iron shipped from Southern furnaces to the North and Western territory is foundry iron, and does not compete with the basic iron produced by Northern furnaces.

In opposing the reduction the Belfont Steel & Wire, Ironton, Ohio, and the Wheeling Steel Corporation, Wheeling, W. Va., declare that the failure of Southern iron to get a greater share of the Northern markets is due to furnace prices and not to freight rates. Southern producers, it is contended, have a larger home market now for their iron than in former years. It would seem, the brief of these interests says, that Birmingham producers by reason of their greatly increased home demand are no longer willing to make pig iron prices necessary to overcome their geograph-

ical disadvantage in the Northern markets. The By-Products Coke Corporation and Pickands, Brown & Co., declare in a joint brief that the reductions cannot be made without seriously endangering and disturbing the entire pig iron rate structure in central territory.

Wholesale Prices Higher

Commodity prices in August are reported by the Bureau of Labor Statistics, Washington, at 60.4 per cent higher than in 1913. This is a slight increase over the 59.9 per cent reported for July. Among the items showing increase is that of metals and metal products, which advanced from 26.4 per cent above 1913 to 27.3 per cent. In both months, however, this is by far the lowest item in the list. The highest continues to be cloths and clothing, at 89.7 per cent. Building materials are still 72.4 per cent above pre-war.

Compared with a year ago, nearly all items show an increase. The average has gone up from 49.7 per cent to 60.4 per cent. Metals and metal products show a drop from 30.4 to 27.3 per cent and housefurnishing goods a drop from 71 to 69.2 per cent. Cloths and clothing at about 90 per cent and fuel and lighting at about 70 per cent remain virtually stationary. All other groups showed increases. The only one now above the average, aside from those already mentioned, is that of farm products, at 63.1 per cent.

NEW TRADE PUBLICATIONS

Capacitors.—General Electric Co., Schenectady, N. Y. Bulletin GEA-77 of 24 pages is devoted to apparatus for power factor correction. This is of use in connection with induction motors and other inductive apparatus, much of which is used in industrial plants. Diagrams of connections and lists of sizes for varying conditions occupy about half of the bulletin.

Safety Guards.—Buffalo Iron Works Co., 290 Terrace, Buffalo. Catalog No. 9 describing and illustrating Buffalo custom built machine, belt and safety guards. Size, 24 pages, 5 x 8 in.

Vacuum Recorders.—Uehling Instrument Co., Paterson, N. J. Bulletin No. 140 describes vacuum recorders of the company's make, which operate on the mercury column principle and employ no moving parts, springs or diaphragms. Permanent accuracy is claimed for this principle.

Stokers.—Detroit Stoker Co., General Motors Building, Detroit. Bulletin No. 1018, of 32 pages, describing the Detroit underfeed stokers of the single retort type. Included are a number of fuel bed cross sections, showing conditions of the fire with respect to air distribution and movement toward the dumps. One section of the book is devoted to the application of the stoker to both low and high set boilers. Another section shows how twin settings serve very large boilers.

Endless Belts.—L. H. Gilmer Co., Tacony, Philadelphia. Catalog of 30 pages describing woven endless fabric belts made under Mr. Gilmer's 1903 patent. Among the belts described are included: endless flat cord belts, rubber V belts, cord rubber belts, fabric rubber belts and round belts, including both the web and the rope types. Data are given on small belt drives, with pulley characteristics, etc.

High Tension Switches.—Pacific Electric Mfg. Co., San Francisco. Bulletins Nos. 301, 1500, 6000 and 14,000 are devoted to switch gears for high-voltage electric circuits. Considerable data are given showing capacities, weights and prices, together with dimensions of important parts. Methods of connecting up are shown by diagrams.

Reciprocating Grate Stoker.—Advance Machinery & Supply Co., Railroad Building, Denver. Folder describing stoker with reciprocating grate bars and horizontal air passages, designed to avoid the formation of clinkers. The stoker is operated mechanically.

Foundry Equipment.—Whiting Corporation, Harvey, Ill. A series of catalogs in loose-leaf form with binder has been published by this company, embracing lines that are thumb indexed as follows: cranes, cupolas, ladles, tumblers, core ovens, trucks, turntables and trolley systems, air hoists, elevators, converters and brass foundry equipment. All of these various lines are adequately covered and the various catalogs are profusely illustrated.

Lubricating Oils.—William C. Robinson & Son Co., Baltimore, Md. Booklet devoted to lubricating oils for various purposes.

Underground Cable.—Hazard Mfg. Co., Wilkes-Barre, Pa. Two booklets have been published by this company, one devoted to steel tape armored parkway cable, and the other to spiralweave wires and cables. The parkway cable is especially designed for underground power transmission, while the spiralweave cables are recommended for use wherever there is unusual wear or strain.

Vacuum Pumps.—Connersville Blower Co., Connersville, Ind. A 4-page booklet devoted to different types of Connersville pumps, particularly those adapted to priming.

Lathes.—Niles-Rement-Pond Co., 111 Broadway, New York. A 16-page illustrated booklet devoted to "Time Saver Lathes," which are built in 27, 30 and 36-in. sizes. The name "Time Saver" has been applied to this type of lathe because of its driving power, strength and rigidity. It is claimed that by the use of this machine the time required to take the heaviest possible cuts in high-speed steels is reduced to a minimum.

Ground Thread Taps and Thread Hobs.—Pratt & Whitney Co., Hartford, Conn. An 8-page illustrated booklet devoted to Pratt & Whitney thread taps and hobs, which are claimed to have materially reduced assembly delays and to have practically eliminated rejections due to inferior threading.

Steam Specialties.—Reliance Gauge Column Co., Cleveland. This is a 16-page booklet with cover, illus-

trated, devoted to Reliance steam specialties which are especially designed for the new demands of high pressure boilers.

Fuel Oil Pumping.—Ames Pump & Machinery Corporation, New York. Folder of four pages, called Specification No. 102, describing the Ames unit system of pumping, heating and straining fuel oil, with automatic control of temperature and pressure. This is designed for mechanical, steam or air atomizer oil burners.

Petroleum Refining.—J. G. White Engineering Corporation, 43 Exchange Place, New York. Booklet of 28 pages describing complete oil refinery, designed and erected by the White company in Wyoming, 7000 ft. above sea level. This plant is capable of running 10,000 bbl. per day of Wyoming crude oil and of cracking 5000 bbl. of residuum, producing gasoline, kerosene and all grades of lubricating oils.

Expansion Joints.—Mogul Machine Co., Witherspoon Building, Philadelphia. Bulletin EXJ-1, describing double-end guided expansion joints designed to maintain perfect alignment. The expansion tube is concentrically guided and supported at both ends.

High-Temperature Insulation.—Celite Products Co., Los Angeles. Reprint in 16 pages of a lecture compiled by the company for use by engineering departments of colleges and universities. This is well illustrated, both by photographs and line-cuts. It deals with methods of heat transmission through heated walls, giving formulas for determining heat losses, etc.

Welding Rods.—Chicago Steel & Wire Co., 103rd Street and Torrence Avenue, Chicago. Booklet devoted to the properties of steel welding rods for gas and electric welding. Data were gathered by the research department of the company, the first half of the 28 pages being devoted to general consideration of the subject.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Bulletin 169FE deals with the use of ball bearings in speed-reducing units, featuring a number of single-row or radial bearings taking care of spur gears. The unit is designed for low power consumption.

Cold Rolling Mills.—Blake & Johnson Co., Waterbury, Conn. Folder of three pages devoted to cold rolling mills for making flat wire and wire of square and other shapes, half round, oval, half oval, diamond, round cornered, etc. Standard specifications include rolls from 3 in. to 10 in. diameter, with motors from 3 to 25 hp. and total weights from 450 to 5050 lb.

Draft Instruments.—Republic Flow Meters Co., 2240 Diversey Parkway, Chicago. Folder of four pages showing multiple draft indicators, pressure indicators and recorders for boiler plants.

Gas Regulators.—Alexander Milburn Co., Baltimore. Bulletin No. 200A, illustrated, describes Milburn regulators, showing their adaptation to reducing the varying gas pressures as required for welding and cutting. One section is devoted to manifolds for oxygen, acetylene and other gases. Size, eight pages, 9 x 12 in.

Strip Metal Reels.—Blake & Johnson, Waterbury, Conn. Folder of two pages describing a reel with automatic block and motor drive for reeling, coiling or winding strip metal under tension as it emerges from a cold rolling mill, slitter, or other machine.

Electric Rivet Heaters and Shop Appliances.—American Hoist & Derrick Co., St. Paul, Minn. Bulletin of 16 pages featuring various types of electric rivet heating apparatus, both for shop use and for field use. Other apparatus illustrated includes electric ring heaters for tires and other similar pieces, electric oil hoist, magnetic portable tool support, magnetic chuck and electric bar welder.

Forgings.—Mid-West Forging Co., First National Bank Building, Chicago. Catalog illustrating light forgings, springs and other parts required by the agricultural implement industry.

Portable Electric Screw Driver.—United States Electrical Tool Co., Cincinnati. Booklet telling in an interesting way of the applications of portable electric screw, nut and stud drivers in stepping up production. Size, 14 pages, illustrated, 5 x 8 in.

Conveyors.—Cecil R. Lambert Co., 3454 Denton Street, Detroit. Brochure on conveyor applications designed to lower material handling costs.

Padlocks.—E. T. Fraim Lock Co., Lancaster, Pa. Catalog No. 30, the largest ever issued by the company. A notable innovation is the classification of padlocks with respect to their construction, the latter being illustrated in each class. Individual key blank catalogs also have been prepared.

Machinery Markets and News of the Works

LARGE RAILROAD LIST

Norfolk & Western Issues Inquiry for About 80 Items of Equipment

Buying This Month Is Satisfactory Though Demand of Automotive Industries Is Declining

THE outstanding item of interest in the machinery trade this week is the inquiry of the Norfolk & Western Railroad for about 80 tools. This is the largest railroad list in some time. Buying by the railroads in the past month or two has not been of large proportions, but considerable business is pending on which action has been repeatedly deferred.

Automobile manufacturers are not quite such active buyers as they were a month ago. Most of the inquiries from that source are for single machines.

A marked improvement in business from the general industrial field is reported by many of the machine tool builders, who now expect that present momentum will be maintained at least through this month and next.

New York

NEW YORK, Oct. 13.

PROGRESSIVE improvement in machine tool business is noted by some of the leading sellers in the New York territory. The sales records of one of the large dealers shows that October is showing a slight gain over September, just as September went ahead of August. Railroad buying is of small proportions, but occasional orders for single tools are being placed. The New York Central has bought a 6-ft. radial drill from the Niles-Bement-Pond Co.

The Flint Rock Products, Inc., 220 West Forty-second Street, New York, has leased dock property on the East River and ground floor space in an adjoining building for new works.

The Westinghouse Lamp Co., 150 Broadway, New York, has filed plans for an addition to its plant on Arlington Avenue, Bloomfield, N. J., 52 x 100 ft., and 50 x 93 ft., to cost \$90,000. Stone & Webster, Inc., 147 Milk Street, Boston, is engineer.

The Keystone Equipment Co., 1947 Broadway, New York, has inquiries out for used boiler tubes, 4-in. diameter, up to about 500 tons; also for three locomotive type boilers, 75 to 150 hp. each.

William Shary, 22 East Seventeenth Street, New York, architect, has completed plans for a two-story automobile service, repair and garage building, 109 x 142 ft., at 149th Street and Austin Place, to cost about \$60,000.

The Lake Champlain Pulp & Paper Co., Plattsburg, N. Y., has awarded a general contract, without competition, to J. J. Fitzpatrick & Sons, Bridge Street, for a one-story addition, 80 x 100 ft., and improvements in present mill, to cost \$55,000.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Oct. 27 for a quantity of wire rope for the Brooklyn and Mare Island navy yards, schedule 4476; until Nov. 3 for 12 ventilating sets and 12 propeller fans and spare parts for the Brooklyn yard, schedule 4491.

The Packard Motor Car Co., Broadway and Sixty-first Street, New York, has acquired property on East Fordham Street, 180 x 200 ft., as a site for a new service, repair and sales building, to cost \$150,000.

The Board of Education, Newburgh, N. Y., is planning

the installation of manual training equipment in its proposed three-story high school at South Street and Fullerton Avenue, to cost \$250,000, for which bids will be asked on general contract early next year. W. F. Gilbert, 358 Fifth Avenue, New York, is architect.

Fire, Oct. 6, damaged a portion of the plant of the Century Art Metal Works, 427 Kent Avenue, Brooklyn, with loss reported at \$25,000 including equipment.

Plans are under way for a reorganization of the Caddo Central Oil & Refining Co., 61 Broadway, New York, with plant at Shreveport, La. The change will include the purchase of considerable machinery for expansion. F. W. Carn-jost is second vice-president, in charge of operations at Shreveport.

M. F. O'Connor, 455 Allen Street, Hudson, N. Y., architect, will soon take bids for a three-story automobile service, repair and garage building, 45 x 100 ft., to cost \$60,000.

The Florence Pipe Foundry & Machine Co., Florence, N. J., has awarded a general contract to the Austin Co., Philadelphia, for a one-story foundry addition, 100 x 300 ft. Charles D. Green is company architect. C. L. Reeves is superintendent.

Fire, Oct. 2, destroyed the plant of the Atlantic Tank & Barrel Corporation, Hoboken, N. J., with loss of \$250,000 including equipment. Plans for rebuilding are under advisement.

The Standard Oil Co. of New Jersey, 26 Broadway, New York, has filed plans for a two-story addition at its refinery at Constable Hook, Bayonne, N. J., to cost \$70,000. a

The Public Service Electric & Gas Co., Public Service Terminal, Newark, N. J., will build a three-story power substation and switching plant at the foot of Duffield Street, Jersey City, N. J., to cost \$100,000.

The McNeill Cooperage Co., Phillipsburg, N. J., has acquired the plant of the Bayway Cooperage Co., Rahway, N. J., totaling 20,000 sq. ft. of floor space on a three-acre tract. The new owner plans the immediate erection of additions and the installation of new equipment. V. J. Blow is president.

The Atlas Fence Co., 1 Clinton Street, Newark, manufacturer of iron and wire fencing, expects to ask bids in November for its proposed plant on Verona Avenue, to be one-story, 50 x 100 ft. Frank C. Zuch is president.

The Jenkins Mfg. Co., 35 Farrand Street, Bloomfield, N. J., manufacturer of brass goods, has plans for a one-story foundry addition.

The Board of Education, Long Branch, N. J., plans the installation of manual training equipment in its proposed three-story high school at Westwood and Eastbourne Avenues, to cost \$500,000, for which bids are being asked on a general contract until Oct. 19. Ernest A. Arend, Kinmouth Building, Asbury Park, N. J., are architects, and Guilbert & Betelle, Chamber of Commerce Building, Newark, are consulting architects.

The Art Store Fixture Mfg. Co., 59 Poinier Street, Newark, has purchased the former five-story factory of the McLaurin-Jones Co., 47 McClellan Street, for a new plant, and will remove to this location. Equipment will be provided for larger output.

Buffalo

BUFFALO, Oct. 12.

BIDS will soon be asked by the Wurlitzer Mfg. Co., Falls Boulevard, North Tonawanda, N. Y., manufacturer of pianos and musical instruments, for a three-story and one-story addition, 60 x 140 ft., and 18 x 100 ft., with wing 40 x 100 ft. on first noted building, to cost \$175,000 with equipment. Thomas McKaig, Orchard Park, N. Y., is structural engineer. Headquarters of the company are at Cincinnati.

The Tucker Foundry Co., Medina, N. Y., has been formed with a capital of \$250,000 to take over and operate the foundry of the Central Foundry Co., recently discontinuing production. Iron and other metal castings will be manufactured. The new company is headed by A. H. and M. E. Tucker, F. W. Austin and F. C. Tillman.

The Elmwood Pattern Works, 1934 Elmwood Avenue, Buffalo, manufacturer of metal and wood patterns, has filed plans for a one-story pattern shop at 277 Hinman Street.

The Board of Works, Buffalo, has authorized plans for a steel tank and water tower, capacity 100,000 gal., to cost \$110,000 with auxiliary equipment.

The Niagara, Lockport & Ontario Power Co., Lockport, N. Y., has applied for permission to construct a new power plant at Limestone, Cattaraugus County, N. Y.

The Niagara Clock Corporation, 2964 Main Street, Buffalo, is arranging for the construction of a new plant to cost \$45,000.

The Board of Trustees, Endicott, N. Y., will soon take bids on revised plans for a new power house at the proposed three-story hospital. The entire project will cost about \$350,000. Walter Whitlock, Security Mutual Building, Binghamton, N. Y., is architect.

Harry G. Lyons, operating a lumber yard and mill at 50 Market Street, Station A, Jamestown, N. Y., is in the market for electrically operated wood-working machinery and transmission equipment, for installation in a building under construction.

Plans have been filed by the Jamestown Blower Co., 727 East Second Street for a one-story brick and steel factory, to cost \$25,000 exclusive of equipment.

The Jamestown Metal Desk Co., 104 Blackstone Avenue, Jamestown, N. Y., has awarded a general contract to the Warren Construction Company, Gokey Building, for a one story brick addition, 84 x 142 ft., to cost \$35,000. Considerable equipment will be required. John A. Jones is secretary.

The Porter-Cable Machine Co., Syracuse, N. Y., has recently received several orders for lathes from England, France and Russia.

Philadelphia

PHILADELPHIA, Oct. 12.

CONTRACT has been awarded by the Atwater Kent Mfg. Co., 4937 Stenton Avenue, Philadelphia, manufacturer of radio equipment, to Irwin & Leighton, 126 North Twelfth Street, for a one-story and basement addition at Roberts and Abbottsford Avenues, 225 x 514 ft., to cost \$475,000 with equipment. The Ballinger Co., 105 South Twelfth Street, is architect.

The Bureau of Supplies and Accounts, Navy Department, Washington, is asking bids for a quantity of aluminum alloy rivets for the Philadelphia navy yard, until Oct. 20, schedule 4489.

The Board of Education, City Hall, Philadelphia, plans the installation of a manual training department in the proposed three-story junior high school at Fifty-third Street and Media Avenue, to cost \$1,250,000, for which bids will be asked on general contract this month. Edwin J. Catherine is architect.

The John A. Roebling's Sons Co., Trenton, N. J., manufacturer of wire rope, cables, etc., has received a low bid from the Industrial Construction Co., 815 Bryant Street, San Francisco, for the erection of its proposed two-story plant at San Francisco, to cost about \$250,000 with equipment. Contract will soon be let. Frederick W. Quandt, Humboldt Bank Building, San Francisco, is architect.

The Victor Talking Machine Co., Camden, N. J., is arranging for increased production at its plant of a recently perfected mechanical talking machine device for improved reproduction. It is purposed to increase the present working force of about 8500 to more than 14,000. E. R. Fenimore Johnson is vice-president.

Whale & Co., Market and Landon Streets, Kingston, Pa., have tentative plans for a new two-story automobile service, repair and garage building, to cost \$150,000 with equipment.

The Penwood Co., 131 North Fifteenth Street, Philadelphia, architect, has completed plans for a two-story automobile service, repair and garage building, 52 x 134 ft., to cost \$60,000 with equipment.

The Tomlinson Corporation, 142 North Seventh Street, Philadelphia, plumbing equipment and supplies, has awarded a general contract to the A. Raymond Raff Co., for a new storage and distributing plant to cost \$70,000.

The Pennsylvania Furniture Works, Inc., Limerick, Pa., has acquired a three-story factory at Gilbertsville, Pa., and will remodel for a new plant.

The York City School Board, West King Street and

Cherry Alley, York, Pa., is said to be planning the installation of a manual training department in its proposed senior high school at West College Avenue and South Beaver Street, to cost \$1,000,000, for which bids are being asked on a general contract until Oct. 15. John B. Hamme, City Bank Building, is architect.

The Boston Iron & Metal Co., Chester, Pa., has acquired the local plant of the Baldt Anchor & Chain Co. from the Cambridge Trust Co., acting as trustee, for \$125,000. No announcement has as yet been made by the purchaser regarding resumption of operations or further disposition.

Officials of the United Lighting Co., Albion, Pa., have formed the Penn Central Light & Power Corporation to take over the plants and system of the Penn Central Light & Power Co., Altoona, Pa. A bond issue of \$5,500,000 is being sold, a portion of the fund to be used for the acquisition and proposed extensions and betterments. Albert Emanuel is president.

The Cox Lime & Stone Co., Conshohocken, Pa., is planning the early rebuilding of its lime hydrating plant, recently destroyed by fire with loss of about \$75,000, including equipment. Considerable new machinery will be installed.

The Glasgow Iron Co., Harrison Building, Philadelphia, is said to have preliminary plans for rebuilding the portion of its works at Pottstown, Pa., recently destroyed by fire, with loss of about \$100,000 including equipment. The company manufactures boiler plates, nails and kindred products.

The Charles Durand Co., Vineland, N. J., has been incorporated with capital stock of \$25,000 to manufacture a complete line of crystal and opal glass towel bars and shelves, also a full line of nickel plated and white enameled bathroom accessories. The incorporators are Charles Durand, Charles Snyder and Mervin W. Logan, all of whom have had experience in this business.

New England

BOSTON, Oct. 12.

MACHINE tool sales in this market the past week continued in good volume. In all but a few instances individual transactions involved single machines, with most of the orders again coming from small shops. Leading manufacturers are still inclined to hold up appropriations for equipment. The largest sale reported recently was a horizontal boring machine, milling machine, drill and small lathe for a Greater Boston foundry. Other orders included horizontal boring machines, lathes, planers, drilling machines and miscellaneous equipment. A Rhode Island shop bought a fairly large milling machine; a central Massachusetts company a 1½ x 18-in. turret lathe; a Maine manufacturer a large boring mill; a Meriden, Conn., silver manufacturer closed on a drop hammer and a North Attleboro, Mass., metal worker purchased a similar machine. Joseph Beal & Co., Boston, were low bidders on sheet metal-working equipment for the Mechanics Art high school, and the Air Reduction Sales Co. low bidder on welding equipment for a trade school.

Sales the last day or two have dropped off, but in the past fortnight there has been a noticeable increase in new inquiries, some of which give evidence of closing shortly. Makers of certain types of machine tools have notified local houses of an impending advance in prices.

Small tools, machine parts, etc., continue in good demand. Some small tool manufacturers are fully three weeks behind on deliveries.

The plant to be erected by the Gillette Safety Razor Co., South Boston, will be eight or nine stories, 75 x 170 ft. Charles T. Main, 200 Devonshire Street, is the engineer.

The Edison Electric Illuminating Co. of Boston, 39 Boylston Street, contemplates the erection of a substation on Bulfinch Street, for which a crane will be required. Bigelow & Wadsworth, 3 Hamilton Place, are the architects.

Preliminary work has started on a wood-working plant on Hancock Street, Quincy, Mass., to cost \$225,000, for the Norfolk Wood Working Co., Braintree, Mass. It will be 140 x 260 ft. L. S. Joslin, 339 Newbury Street, Boston, is the architect.

Bids close this week for a proposed one-story, 52 x 105 ft. paper mill addition for the American Tissue Paper Co., South Hadley, Mass. B. S. Perkins is manager. Motors and other

The Crane Market

WHILE there is a fair volume of business in overhead cranes, it is largely confined to a few prominent companies. Inquiry for locomotive cranes continues light. Among the lists of overhead equipment now in the market are those of the Chile Exploration Co. for five large overheads and the Andes Copper Mining Co. for 15 large overheads for Chile, to which have been added the list of the Anaconda Copper Mining Co. of the same corporation for six large capacity cranes for use in the United States. It is expected that all three lists will be awarded at the same time, possibly going to one crane builder for a lump sum. The list of gantry cranes for which the Delaware, Lackawanna & Western Railroad has been in the market, a 10 or 15-ton gantry for Buffalo, a 15 or 20-ton for Passaic and a 15-ton for Cortlandt, N. Y., is expected to close in a few days. The list of five 1-ton and one 2-ton 2-motor hoists from the Long Island Railroad is expected to close shortly. The Brooklyn-Manhattan Transit Co. inquiry for two 10-ton electric cranes has been placed, but the inquiry of the New York Rapid Transit Co., part of the same corporation, for a 7½-ton, 44-ft., 11-in. span overhead crane, is still pending.

In the Pittsburgh district a number of cranes for plants of the Carnegie Steel Co. have been quoted against, and the Aluminum Co. of America is taking bids on 19 cranes for its new Canadian plant.

equipment will be required. Howes & Howes, 199 High Street, Holyoke, Mass., are the architects.

The metal-working machinery and equipment of the Union Cutlery & Hardware Co., Unionville, Conn., stainless steel cutlery, was sold at public auction Oct. 8. Much of the equipment was taken by New England and New York machine tool dealers.

The Sherman Power Construction Co. has awarded contract to the Westinghouse Electric & Mfg. Co. for a vertical waterwheel generator equipped with thrust-bearing and air-operated brakes, four 3000 oil-insulated self-cooling transformers and automatic switching equipment, to cost \$175,000, for a new generating station in western Massachusetts.

Kraft-Lamson, Inc., Edgewood, R. I., has been incorporated to manufacture a domestic oil burner. All connections have been made, including the letting of a contract for the foundry work.

C. W. Smith, 38 West Main Street, Marlboro, Mass., is engaging in the manufacture of oil burners and is in the market for materials, including oil pumps, oil tanks and electric motors, and may be in the market for contract work in the near future.

Thomas McGrath, 9 Federal Street, Providence, R. I., will erect a two-story jewelry manufacturing plant, 60 x 100 ft. Francis Chiaverini, 32 Broadway, is architect.

The Fields Corner Brass Foundry Co., 9 Brooks Street, Boston, has plans for a new one-story foundry to cost about \$13,000.

The Morrills Planing Mill, Inc., 103 Commercial Street, Portland, Me., will rebuild the portion of its plant destroyed by fire Oct. 1, with loss reported at \$50,000 including equipment.

The Webb Oil Co., 8 Durfee Street, Fall River, Mass., has plans under way for a two-story automobile service, repair and garage building, 120 x 142 ft., to cost \$150,000 with equipment.

The Bennett Wire Co., Water Street, Norwalk, Conn., has plans for two additions, 30 x 42 ft., and 32 x 34 ft., for which foundations will be laid at once.

The Realty Development Syndicate, 17 East Forty-fifth Street, New York, a subsidiary of the Insull public utility interests, Chicago, headed by Samuel Insull, president Middle West Utilities Co., 72 West Adams Street, will proceed with the construction of a hydroelectric power plant on the Contoocook River, near Hillsboro, N. H., with capacity of about 20,000 hp., to cost \$750,000. The Vaughan Engineers, 185 Devonshire Street, Boston, are engineers in charge.

The Putnam Foundry & Machine Co., Putnam, Conn., is said to be contemplating the early rebuilding of the portion of its plant recently destroyed by fire.

The Milford Electric Light & Power Co., Milford, Mass., has plans for a two-story addition to its power house to cost about \$50,000. E. L. Rawson, 6 Beacon Street, Boston, is architect.

The Nolos Grease Cup Co., 56 Washington Street, Providence, R. I., has been incorporated to manufacture the Nolos

Among recent purchases are:

Chesapeake & Ohio Railroad, two 25-ton locomotive cranes, reported purchased from the McMyler-Interstate Co.

Ulen Contracting Co., 120 Broadway, New York, two 25-ton locomotive cranes from the Industrial Works.

Cranford Co., Brooklyn, N. Y., a 10-ton, gasoline-driven, crawl-tread locomotive crane from the Northwest Engineering Co.

Koss Construction Co., Kansas City, Mo., a 10-ton, gasoline-driven, crawl-tread locomotive crane from the American Hoist & Derrick Co.

American Gas & Electric Co., 30 Church Street, New York, two 100-ton, three 25-ton and two 10-ton electric overhead cranes for Pittston, Pa., from the Whiting Corporation.

Phoenix Utility Co., 71 Broadway, New York, two 5-ton, single I beam, hand-power cranes, award of which has been pending for several weeks, from the Chisholm & Moore Mfg. Co.

Wabash Railway Co., St. Louis, Mo., two 25-ton, 60-ft. span overhead traveling cranes from the Niles-Bement-Pond Co.

Carnegie Steel Co., Pittsburgh, three 15-ton, 115-ft. 4-in. span, double drum cranes for Homestead, Pa., from the Alliance Machine Co.

Brooklyn-Manhattan Transit Co., Brooklyn, N. Y., two 10-ton electric cranes from Maris Brothers.

grease cup, which, it is claimed, feeds grease to bearings automatically. The cup will be made of brass with oil working parts of steel, and will be manufactured in two sizes. For the present the company will have the cup manufactured on contract.

South Atlantic States

BALTIMORE, Oct. 12.

PLANS are being arranged by the Kelly-Springfield Tire Co., Cumberland, Md., for enlargement of its local plant, where operations will be concentrated in the future. It is proposed to remove the Akron works to this location and discontinue production at that point. Louis Mueller, heretofore plant manager at Akron, will serve hereafter in like capacity at the Cumberland works.

The Black & White Taxi Co., Union Station, Washington, operated by Brown Brothers, has plans for a one to four-story addition at its service, repair and garage building on Twenty-fourth Street, between M and N Streets, N. W., 208 x 235 ft., to cost about \$350,000 with equipment.

The Interocean Oil Co., Baltimore, recently organized, has acquired the plants and property of the Interocean Oil Co. of North Dakota, and the United States Asphalt & Refining Co., in the Curtis Bay section, totaling 100 acres. Plans are under advisement for extensions and additional equipment installation. Holden A. Evans heads the new company.

The United States Engineer, 1068 Navy Building, Washington, is asking bids until Oct. 19 for 18 sluice gates, circular 126.

The Maryland Equipment & Supply Co., Equitable Building, Baltimore, has inquiries out for crushing machinery, Gates type K, and accessory equipment.

The Mack International Motor Truck Corporation, 25 Broadway, New York, has acquired property at Twentieth, Hope and Alsquith Streets, Baltimore, 245 x 308 ft., and is reported to be planning new works at this location.

The office of the chief of air service, United States Army, Washington, is asking bids until Oct. 26 for reducing bushings, air relief valve assemblies, pipe plugs, hose nipples and kindred equipment, circular CAS 26; until Oct. 20 for aircraft instruments, circular CAS 23.

The Davis Foundry & Machine Works, Rome, Ga., has inquiries out for two boilers, 150 to 200-hp. capacity, each.

The Water Committee, Culpeper, Va., R. F. Booton, chairman is asking bids until Oct. 20 for equipment for a municipal waterworks, including one 1,000,000-gal. per day capacity high service pump; one pumping unit, same capacity, for low service; both to be operated by semi-Diesel or full Diesel fuel oil engine, with complete accessories; also alternate bids on fuel oil engine with high service triplex pump and low service centrifugal pump. The Ambler Engineering Co., Travelers' Building, Richmond, Va., is engineer.

Ovens, power equipment, conveying and other machinery will be installed in the three-story and basement plant to be erected at Baltimore by the Ward Baking Co., 362 Southern Boulevard, New York, to be 150 x 390 ft., estimated to cost \$1,000,000 with equipment. C. B. Comstock, 110 West Fortieth Street, New York, is architect.

The Board of District Commissioners, District Building, Washington, is arranging final plans for the proposed two-story and basement McKinley manual training school at Second and T Streets, N. E., to cost \$2,000,000. A. L. Harris, District Building, is architect.

The Battery Machinery Co., Rome, Ga., has inquiries out for a heavy duty engine lathe, with quick change gear, bed up to 20 ft. long; also for a horizontal milling machine, with 30-in. feed.

Northup & O'Brien, Starbuck Building, Winston-Salem, N. C., architects, have plans for a three-story automobile service, repair and garage building, 85 x 200 ft., to cost \$100,000 with equipment.

The Bureau of Supplies and Accounts, Navy Department, Washington, is asking bids until Oct. 27, for one motor-driven precision lathe, with spare parts, for the Mare Island Navy Yard; one motor-driven drill press and spare parts, and one electric grinder and spare parts for the Puget Sound Navy Yard, schedules 4477 and 4478, respectively.

R. P. Johnson, Wytheville, Va., machinery dealer, has inquiries out for two 125-hp. horizontal return tubular boilers, 72 in. x 10 ft., with 125 lb. working pressure.

The Leigh Banana Case Co., 2230 South Union Street, Chicago, Carl G. Leigh, president, is completing plans for a new veneer mill at Ellenton, S. C., totaling about 50,000 sq. ft. It will cost close to \$125,000 with equipment.

The Georgia Southern Power Co., Mills Building, Washington, is said to be planning extensions in its power house at Milledgeville, Ga., including the installation of a steam turbine and auxiliary equipment.

The Icy-O Co., Inc., Johnston Building, Charlotte, N. C., plans the installation of presses, cutters, tools and other equipment in a local building for the manufacture of patented beverage dispensers. E. C. Stathart heads the company.

The Common Council, Dawson, Ga., is planning to purchase a 200-kva. electric generator, direct-connected to a Corliss or uniflow engine, for installation in the municipal power station. K. S. Worthy is mayor, in charge.

The City Council, Lexington, S. C., is said to be planning the installation of pumping machinery in connection with proposed extensions in the municipal water system. Bonds for \$103,000 have been approved for this and sewage expansion.

The Brunswick Seating Works, Inc., Lawrenceville, Va., has been incorporated with a capital of \$25,000 and will manufacture school and auditorium furniture.

Detroit

DETROIT, Oct. 12.

THE Chadwick-LeClair Co., 5143 Trumbull Avenue, Detroit, is planning for a one-story machine shop, 45 x 85 ft., to cost \$25,000 with equipment.

The Detroit Stoker Co., Monroe, Mich., has awarded a general contract to the H. K. Ferguson Co., Cleveland, for a one-story foundry, 150 x 162 ft.; pattern shop, 60 x 82 ft.; and sand and coke building, 20 x 40 ft. The foundry installation will include an electric traveling crane, monorail system and mechanical cupola charger. The company will remove its plant at Bowling Green, Ohio, to Monroe early in the coming year, concentrating production there. W. H. Rea is president and John D. Campbell, general superintendent.

The Board of Education, Iron River, Mich., plans the installation of manual training equipment in its proposed new high school to cost \$250,000, for which bids will be asked soon. Van Leyen, Schilling, Keough & Reynolds, Detroit, are architects.

The Acme Stamping Works, Zeeland, Mich., manufacturer of automobile brass fittings, has plans for an addition totaling about 10,000 sq. ft., to cost \$25,000 with equipment. John A. Donla is president.

The Lambooy Label & Wrapper Co., Kalamazoo, Mich., manufacturer of paper products, will begin the erection of an addition on Portage Street, one-story, totaling 11,000 sq. ft., to cost about \$30,000 with machinery. Equipment purchases will be made soon. Karl Lambooy heads the company.

The Romeo Foundry & Machine Co., Romeo, Mich., recently formed with a capital of \$75,000, has leased the plant of the Holmes Foundry Co., idle for some time, and will

establish a new works at this location. Extensions and improvements are planned. H. D. Rumsey is president.

The Community Club, Bad Axe, Mich., is negotiating with a company manufacturing steel tools, name temporarily withheld, for the establishment of a local plant. A site is being selected. Local interests are said to be planning to subscribe \$50,000, to bring the industry to the city.

The Michigan Box Co., Muskegon, Mich., recently organized, has leased a factory, which it will remodel, for the manufacture of wood boxes and crates. It is purposed to begin production in November.

The Bohn Aluminum & Brass Corporation, 2512 North Grand Boulevard, Detroit, has awarded a general contract to the C. H. Reisdorf Building Co., 4857 Woodward Avenue, for a one-story addition, 190 x 240 ft. C. W. Brandt, Kresge Building, is architect.

The Despres Dowel Mfg. Co., Grand Rapids, Mich., has plans for a one-story addition, 150 x 170 ft., to cost \$35,000 including equipment.

The Wave Radio Corporation, Royal Oak, Mich., has tentative plans for an addition to provide an increase in output from the present schedule of 300 sets per month to 1000.

The Board of Education, Muskegon Heights, Mich., plans the installation of manual training equipment in its proposed two-story junior high school to cost \$325,000, for which bids have been asked on a general contract. Frank Forster, 40 Lyman Building, Muskegon, is architect.

Chicago

CHICAGO, Oct. 12, 1925.

FROM the standpoint of sales the week has not been as active as the general average maintained during September. Inquiries, on the other hand, have increased, and the trade is anticipating a sustained market for the next 60 days. Several dealers report that the volume of sales so far this year will compare favorably if not exceed any year since 1920. For several weeks buying has been confined largely to small manufacturers in widely diversified fields; during the past week, however, the situation has changed somewhat and more of the larger manufacturers are coming into the market. There is a noticeable tendency for delivery to be extended. Some classes of machines are in good demand and shipment has been extended in many cases to about 60 days. Crank shaft equipment is active and delivery dates are said to be 90 days following placing of orders.

The Nash Motors Co. and the Studebaker Corporation were buyers last week and are expected to make further purchases. The Hannum Mfg. Co., Milwaukee, took several items of equipment for its tool room and it is understood it will place additional contracts this coming week.

The Norfolk & Western Railway Co. is inquiring for the following tools, all 220-volt, 3-phase, 60-cycle motor drives, except as noted otherwise:

One 4½-in. single-spindle automatic bar machine.
One 2½-in. single-spindle automatic bar machine.
One semi-automatic chucking machine, 12 to 14 in. swing.

One semi-automatic thread milling machine for nuts.

One No. 10 steel pressure blower for forge blast, bottom horizontal discharge.

One horizontal boring, drilling and milling machine, 3¼-in. spindle, No. 6 Morse taper, 52-in. traverse.

One 8-ft. cornice brake.

One portable cylinder boring bar, 6 in. x 8 ft., for cylinders 20 to 42 in.

Three 3-ft. plain radial drills with tapping attachment and plain box table.

Five 16-in. vertical single-spindle, high-speed drills.

One 27 in. x 6 ft. centers heavy duty engine lathe, geared head, taper attachment.

Four 18 in. x 8 ft. bed, heavy duty engine lathes, geared head, taper attachment.

Four 16 in. x 6 ft. bed, heavy duty engine lathes, geared head, taper attachment.

Two 14 in. x 6 ft. bed, heavy duty engine lathes, geared head, taper attachment.

One 20-in. x 6 ft. centers, heavy duty engine lathe, geared head, taper attachment.

Two combination journal turning and axle lathes for outside axle journals with 42-in. wheels, to turn also all sizes of standard car axles, 11-in.

hole in driving head and to take 7 ft. 10 in. between centers with gaps open.

One milling machine for finishing face and ends of standard car journal bearings.

One heavy duty vertical milling machine, range 42 in. horizontal, 18 in. cross, 16 in. vertical, 21 in. throat.

One Toledo power drive pipe threading device.

Two $\frac{3}{4}$ -in. to 2-in. pipe threading machines.

One heavy duty frog and switch planer, direct current motor drive, to plane 36 in. high, 36 in. wide and 14 ft. long.

One heavy duty metal planer, d. c. motor drive, 36 in. x 36 in. x 16 ft.

One 50-ton power forcing press, 10 ft. 6 in. between housings, for locomotive and driving brass boxes.

One multiple punch and shear, 24-in. throat.

One gate shear, 24-in. throat.

Two 36-in. foot-operated tinners' squaring shears.

One hand power circle shear to cut circles 3 in. to 22 in. diameter.

One circular shear for steel up to $\frac{1}{8}$ in. thick, d. c. motor drive.

One 90-in. heavy duty locomotive wheel quartering machine, with crank pin turning device to turn crankpins up to 10 $\frac{1}{2}$ in. in diameter x 16 in. long.

One pneumatic gap riveter, $\frac{3}{4}$ -in. rivet, hot; gap 13 $\frac{1}{2}$ in.

One 30-in. wood cut-off saw.

One 24-in. crank shaper.

One 32-in. crank shaper.

One portable crank pin turner for pins 6 in. to 13 in. x 20 in. long.

One 34-in. vertical drill, d. c. motor drive.

One portable cylinder or dome facing machine to face 26 in. to 40 in.

Seven 18 in. x 3 in. double floor grinders.

Two 12 in. x 2 $\frac{1}{2}$ in. swing grinders.

One automatic drill grinder for taper shank drills up to 2 $\frac{3}{4}$ in.

One internal cylindrical grinder for locomotive rod bushings, spindles for grinding holes 4 in. to 15 in. diameter x 16 in. deep.

One portable die sinking grinder.

One Landis die grinder for bolt machine dies. Two universal cutter and reamer grinders with all attachments and fixtures for internal, external and face grinding.

Six 12 in. x 2 $\frac{1}{2}$ in. floor grinders.

One locomotive guide box grinder, 8 in. x 7 in. guides.

One external cylindrical grinder for air pump piston rods.

Four 18-in. turret lathes, taper attachments and automatic feed.

The General Radiator Co., Continental Bank Building, Chicago, is completing plans for a two-story and basement factory at Quincy, Ill., for the manufacture of automobile radiators and parts, to cost \$225,000 with machinery. George P. Behrenmeyer, 430 $\frac{1}{2}$ Main Street, Quincy, is architect. C. W. Gillitt is chairman of the board.

The Minnesota Mining & Mfg. Co., Seventh and Fauquier Streets, St. Paul, Minn., manufacturer of abrasive and grinding materials, etc., has work under way on an addition to cost \$30,000. Toltz, King & Day, Inc., Builders' Exchange Building, is architect.

The By-Products Coke Corporation, 11233 Torrence Avenue, Chicago, will install new coke conveying and handling machinery at its plant to cost about \$120,000.

The Waterway Paper Products Co., 3201-9 South Kedzie Avenue, Chicago, has awarded a general contract to the Schmidt Brothers Construction Co., 22 East Huron Street, for a two-story addition to cost about \$75,000. D. H. Burnham & Co., 160 North La Salle Street, is architect. W. A. Strong is president.

The Board of Education, Lincoln, Neb., plans the installation of manual training equipment in its proposed three-story and basement Irving junior high school, to cost \$650,000, for which bids will soon be asked on a general contract. Fiske, Meginnis & Schaumburg, Bankers' Life Building, are architects.

Brown & Bigelow, Inc., University Avenue and Syndicate Street, St. Paul, Minn., manufacturer of paper boxes and containers, will proceed with the erection of a three-story addition, 82 x 302 ft., to cost \$250,000 with equipment. The James Leck Co., 211 South Eleventh Street, Minneapolis, Minn., is general contractor.

The Board of Education, Rockford, Ill., will install manual training equipment in its proposed three-story Abraham Lincoln junior high school, to cost \$900,000, for which superstructure will soon begin. Peterson & Johnson, Swedish American Bank Building, are architect.

H. Samuels, care of E. C. Ecker & Associates, 110 South Dearborn Street, Chicago, architects, has plans for a one-story machine shop, 75 x 110 ft., to cost about \$22,000.

St. Louis

ST. LOUIS, Oct. 12.

A FUND of \$40,000 is being arranged by the City Council, Blackwell, Okla., for the purchase of a 1250-kw. steam turbine, with accessories, for the municipal power plant. William Ritzhaupt, Jr., is engineer.

The Climax Specialty Co., 1515 Pine Street, St. Louis, manufacturer of rubber products, has awarded a general contract to Trowbridge & Causin, Hannibal, Mo., for a new one-story plant at Troy, Mo., 82 x 100 ft., to cost approximately \$45,000.

The Continental Oil Co., Sapulpa, Okla., operating a local refinery, is said to be arranging a fund of about \$750,000 for the construction of new storage and distributing plants in Oklahoma, Kansas, Missouri and Arkansas.

The Missouri Power & Light Co., Jefferson City, Mo., has arranged for a bond issue of \$6,500,000, a portion of the proceeds to be used for extensions in plants and system.

The Killark Electric Mfg. Co., 3940 Easton Avenue, St. Louis, will soon call for bids for a one-story plant, 142 x 200 ft., to replace the portion of its works recently destroyed by fire, to cost \$50,000 with equipment.

The Gilliland Oil Co., Camden, Ark., is said to be planning for the installation of a gasoline refinery at Carbondale, Ark., to cost approximately \$500,000 with compressors and other machinery.

The City Council, Tuttle, Okla., plans the installation of pumping machinery in connection with a proposed municipal waterworks to cost about \$28,000. The Gantt-Baker Co., 1116 West Main Street, Oklahoma City, Okla., is engineer.

The People's Motorbus Co., 3615 Forest Park Boulevard, St. Louis, has plans for a two-story service, repair and garage building, to cost \$250,000 with equipment. It will be owned by the G. T. Burdeau Realty Co. and occupied under lease.

Ovens, power equipment, conveying and other machinery will be installed in the two and three-story and basement addition, 150 x 190 ft., to be erected by the Campbell Baking Co., Kansas City, Mo., to cost \$425,000 with machinery. Mills, Rhines, Bellman & Nordhoff, Ohio Building, Toledo, Ohio, are architects.

The Ozarks Hydro-Electric Power Co., Little Rock, Ark., is planning the construction of hydroelectric generating plants on the White and Buffalo Rivers, to cost \$700,000 with transmission systems.

The Western Kansas Refining Co., Russell, Kan., has work in progress on a new refinery, to cost about \$300,000 with machinery.

The Ozark Pipe Line Corporation, Richland, Mo., is arranging for a new pumping plant, to include the installation of three pumping units, to cost approximately \$100,000. The company is said to be contemplating the establishment of an ice-manufacturing plant.

Shepard & Wiser, R. A. Long Building, Kansas City, Mo., architects, have plans under way for a two-story automobile service, repair and garage building, 66 x 195 ft., to cost \$70,000 with equipment.

The Jacob Guth Tractor Co., 1109 High Street, St. Louis, has been organized with capitalization of \$100,000 to manufacture and deal in tractors. No definite plans have been made with regard to manufacturing and it is probable that the first tractor turned out will be assembled from parts made elsewhere.

Cincinnati

CINCINNATI, Oct. 12.

ORDERS placed with local machine tool manufacturers the past week totaled large. Sales in October have been satisfactory to many builders, although concerns making a special appeal to railroads have been disappointed because of the lack of demand from this source. Buying by automobile makers continues on an extensive scale, while several machine tool companies report a marked improvement in business from the general industrial field. The movement to purchase new tools is gathering momentum rather than slackening, as some local producers had feared. Inquiries on which bids have already been submitted reach liberal proportions and indications point to considerable buying during the remainder of the year.

Production in local machine tool plants is being speeded up to meet increased demand, and it is believed that operations will be maintained on present schedules throughout October and November.

The Louisville & Nashville is inquiring for three 24-in. and two 30-in. lathes, and the Chicago, Milwaukee & St. Paul is in the market for two 26-in. lathes. It is reported that the Newport News Shipbuilding and Dry Dock Co., Newport News, Va., will ask for bids on a number of tools.

The city of Cincinnati is in the market for a 13-in. x 12-ft. motor-driven gear head lathe. Bids will be received until Oct. 23 by Ernst Von Bargen, purchasing agent, City Hall.

The A. O. Smith Corporation, Milwaukee, which purchased 22 upright drills last week, placed this business with a local builder. The Ford Motor Co. ordered another group of special machines from a Cincinnati company, which already has produced a considerable number for this automobile manufacturer. The Remy Electric Co., Anderson, Ind., bought three tool-room lathes, a jig borer and two shapers, and is reported to have closed with an Eastern builder for machines valued at \$30,000. The Michigan Central purchased three lathes, while the Missouri Pacific, Boston & Albany and Mobile & Ohio each bought a single machine. A Dayton, Ohio, manufacturer ordered eight polishing machines from a local builder. It is understood that the Columbia Power Co., Cincinnati, through its Chicago representatives, Sargent & Lundy, will buy a radial drill, an upright drill, a planer, a shaper, an 8-in. pipe machine and two lathes. The Louisville & Nashville is inquiring for an 18-in. cone-head lathe. This road has purchased a carwheel lathe from the Niles-Bement-Pond Co.

Both sales and inquiries received by planer manufacturers increased the past week. The Cincinnati Planer Co. booked a 24-in. planer for the Crane Co., Chicago, and three 36-in. Hypro motor-driven planers for the Textile Machine Co., Reading, Pa. The Eureka Tool & Die Co., Dayton, Ohio, bought a jig borer, while another Dayton company purchased a vertical shaper. The John Steptoe Co. sold a 20-in. motor-driven shaper to a Texas firm for delivery in Oklahoma. The Illinois Steel Co. bought a 26-in. heavy-duty lathe and the American Laundry Machinery Co., Cincinnati, purchased a large lathe for its Chicago factory. A local builder closed on a gap lathe for shipment to Monterey, Mexico. It is reported that the Troy Laundry Machinery Co., Chicago, will buy a number of tools. The city of Cincinnati will take bids until Oct. 26 on a small lathe.

Boring mill manufacturers state that business has been brisk. The Cincinnati Planer Co. sold a 6-ft. boring mill to the Gulf Refining Co., Beaumont, Tex. The Black & Clawson Co., Hamilton, Ohio, which inquired recently for a boring mill, is reported to have closed for a machine. The Boston & Maine Railroad bought a 36-in. rotary miller, while the Chrysler Motor Corporation added another lathe to its recent purchases in this market.

The Miami Garage Co., 29 West First Street, Dayton, Ohio, has awarded a general contract to Frank Hill Smith, Inc., local, for a new service, repair and garage building at 23-29 West First Street, to cost \$175,000.

The Hiner Structural Steel Co., Canton Building, Canton, Ohio, is contemplating a one-story addition to its plant at Louisville, Ohio, 60 x 145 ft., to cost \$45,000.

The Watson Lumber & Mfg. Co., Madisonville, Tenn., has work under way on rebuilding its plant recently destroyed by fire. Considerable machinery will be installed. A. C. Watson is secretary.

The West Kentucky Electric Power Co., Earlington, Ky., is disposing of a bond issue of \$1,000,000, a portion of the proceeds to be used for extensions in power plants and system.

The Chattanooga Stamping & Enameling Co., Chattanooga, Tenn., has plans for three one-story additions, two 50 x 100 ft. and the other 30 x 60 ft., with additional equipment to increase the present capacity about 50 per cent. The work is estimated to cost \$50,000.

Alexander M. Robinson, Georgetown, Ky., machinery dealer, has inquiries out for a direct-heat dryer, about 6 x 60 ft., Ruggles-Coles or equal standard manufacture.

The Noel Ice & Cold Storage Co., 607 Tenth Avenue, North, Nashville, Tenn., will soon begin the construction of a new unit, comprising an eight-story cold storage and refrigerating building, to cost \$450,000.

The Monarch Marking System Co., Dayton, Ohio, manufacturer of price-marking machinery, has taken bids for an addition to cost close to \$50,000. Schenck & Williams, Dayton, are architects.

The Board of Trustees, Erie Home, Olive Hill, Ky., plans the installation of a manual training department in a new school building to cost \$75,000. Wilson B. Parker, Board of Trade Building, Indianapolis, is architect.

The Sieve & Lange Co., 3741 Warsaw Avenue, Cincinnati, has plans for a one-story machine and repair shop, 110 x 140 ft., to cost \$50,000 with equipment. Rendigs, Panzer & Martin, Southern Ohio Bank Building, are architects.

The Illinois Central Railroad Co., Chicago, has awarded contract to the Ellington-Miller Construction Co., Paducah, Ky., for a one-story forge and blacksmith shop at its local repair works.

The Pardoe Lock Co., 286 South Second Street, Memphis, Tenn., is preparing specifications on its locking devices, which will be available within the next 30 days to manufacturers interested in bidding for the manufacturing contract. The line includes padlocks, mortise locks, door locks and closet locks.

Gulf States

BIRMINGHAM, Oct. 12.

WORK will begin on a new plant for the Mason Fiber Co., Laurel, Miss., for the manufacture of insulated wall board products and kindred specialties, to cost \$200,000 with machinery.

The Public Utilities Co., Inc., Clearwater, Fla., is contemplating the erection of a one-story ice-manufacturing plant with initial capacity of about 50 tons per day. Edward A. Haley is president.

The City Council, Mabank, Tex., plans the installation of pumping machinery in connection with a proposed municipal waterworks to cost \$60,000. The Municipal Engineering Co., Praetorian Building, Dallas, Tex., is engineer.

The plant of the Preston Motor Co., Birmingham, has been acquired by the Strowd-Holcomb Cotton Mills Co., recently organized, and will be converted for textile manufacture at a cost of about \$500,000, including machinery and electric power equipment.

The Alabama Power Co., Birmingham, is disposing of a bond issue of \$5,000,000, a portion of the proceeds to be used for extensions and betterments, including hydro-electric power developments.

The United States Engineer, Galveston, Tex., is asking bids until Oct. 22 for five cast steel drums for hauling gear, circular 40; until Oct. 19 for 15 cutter blades, circular 37.

The Texas Power & Light Co., Interurban Building, Dallas, is arranging for the complete electrification of its ice-manufacturing plant at Luling, Tex., replacing present steam-operated equipment.

The Dallas Vocational School, Dallas, Tex., has begun the construction of the first unit of its proposed school center on the Cedar Springs Road, and expects to have the structure ready for the equipment early in the year. It will cost about \$50,000. Other units will be built later. C. A. Jay is president.

The Town Council, Dania, Fla., is asking bids until Oct. 27 for equipment for a municipal waterworks, including one low-lift and two service horizontal centrifugal pumps, motor-driven, each with rated capacity of 800 gal. per min., with auxiliary equipment. The Main Engineering Co., Daytona, Fla., is engineer.

The Southern Dairies, Inc., Selma, Ala., contemplates the construction of a power house and refrigerating plant at its proposed creamery at Montgomery, Ala., where site has just been acquired. It will cost about \$250,000.

The Midwest Utilities Co., Frost Building, San Antonio, Tex., will soon begin the construction of its proposed hydro-electric power plant on the Guadalupe River, near Gonzales, Tex., to cost about \$250,000 including power dam. A transmission line will be constructed to Cuero, Tex., at a cost of \$150,000.

The Town Council, Bushnell, Fla., will receive bids until Oct. 21 for equipment for municipal waterworks extensions, including one electric-operated pumping unit, and one gasoline engine-driven pumping unit, each with capacity of 500 gal. per min.; one steel tank and tower, 75,000 gal. capacity, valves and accessories. E. V. Camp and Associates, Inc., Jacksonville, Fla., and Atlanta, Ga., is engineer.

The Radyolite Products Laboratory, Box 264, Hattiesburg, Miss., recently incorporated for \$10,000, will manufacture radio receivers, loops, radio frequency transformers and other radio parts.

Indiana

INDIANAPOLIS, Oct. 12.

PLANs have been completed for a one-story foundry, 140 x 180 ft., for the Dill Foundry Co., Rushville, Ind., for which foundations will be laid at once. William Dill is general manager.

The American Spring Clutch Co., Indianapolis, has acquired property heretofore occupied by the Hunter Dry Kiln Co., at 2517 Cornell Avenue, for a new plant to manufacture automobile starting equipment, shock absorbers, lawn mowers, etc. The company has also purchased the plant and business of the Central Gear & Mfg. Co., 311 East South Street, consisting of a two-story factory, aggregating 15,000 sq. ft. of floor space. The purchasing company will continue the manufacture of gears and automotive screw devices at this location. Albert Lieber is president and W. Carleton Starkey, vice-president and general manager.

The Roachdale Water Co., Roachdale, Ind., will soon ask bids for equipment for a proposed local waterworks, to include two centrifugal pumps, 60,000-gal. capacity steel tank and tower and auxiliary equipment. The Herr Engineering Co., Terre Haute, Ind., is engineer.

Pending the rebuilding of its foundry and other structures recently destroyed by fire, the Peerless Foundry Co., Indianapolis, has arranged with a local plant for the production of castings for stoves and furnaces. The new foundry will cost about \$50,000 and it is expected to arrange for equipment purchases soon.

Bids will soon be asked by the City Council, Jasper, Ind., for extensions in the municipal electric light and power plant and the installation of additional equipment. Charles Brossman, Meridian Bank Building, Indianapolis, is engineer.

The Turner Mfg. Co., 112 West Jefferson Street, Kokomo, Ind., manufacturer of automobile equipment and accessories, has taken bids on a general contract for a one-story addition, 80 x 135 ft., to cost \$30,000 with equipment. Elmer E. Dunlap, 1125 North Buckeye Street, is architect.

The Standard Steel Car Co., Hammond, Ind., has awarded a general contract to the Austin Co., Chicago, for a one-story addition, 80 x 335 ft., and improvements in present shops, to cost \$200,000 with equipment. Headquarters of the company are in the Frick Building, Pittsburgh.

Pacific Coast

SAN FRANCISCO, Oct. 7.

THE Sierra Mfg. Co., Sacramento, Cal., is negotiating for a site for the construction of a foundry, assembling works, machine shop and other buildings, for the manufacture of stoves, ranges and kindred products, to cost \$200,000 with equipment. George W. Peltier, president of the Farmers' and Mechanics' Bank, Sacramento, heads the organization. The company was formed recently with a capital of \$500,000.

The Imperial Ice & Development Co., El Centro, Cal., will proceed with the construction of a new ice-manufacturing and cold storage plant, 75 x 225 ft., at Calipatria, Cal., to cost approximately \$75,000 with equipment. Fred Williams is chief engineer.

The Phelps-Dodge Corporation, Douglas, Ariz., will make extensions and improvements in its local copper refinery to cost close to \$1,000,000 including machinery. Headquarters are at 99 John Street, New York.

The Pacific Coast Paper Mills, Inc., Bellingham, Wash., will soon begin the construction of a new mill to cost about \$110,000, including equipment, for which plans are being drawn by T. F. Doan, Sunset Building, architect.

The Occidental Sheet Metal Works, Inc., 910 Maynard Avenue, Seattle, has taken bids for a new one-story plant, 92 x 105 ft., to cost \$22,000. Schack, Young & Myers, Central Building, are architects.

The California Steel Products Co., 452 Bay Street, San Francisco, has purchased about 4 acres at Oakland, Cal., for the construction of a new plant to manufacture boilers and other plate products, to cost approximately \$150,000.

The City Council, Prosser, Wash., plans the installation of pumping machinery in connection with a proposed municipal waterworks to cost \$125,000. Baar & Cunningham, Spalding Building, Portland, are consulting engineers.

A one-story manual training building will be constructed at the proposed new high school at Brawley, Cal., to cost \$250,000. Bids are being asked on a general contract until Oct. 30. G. Stanley Wilson, 646 West Ninth Street, Riverside, Cal., is architect.

The Fillmore Mining Co., Kingman, Ariz., has plans for a new mill, for handling about 25 tons of ore at one time, reported to cost \$100,000 with machinery.

Pittsburgh

PITTSBURGH, Oct. 12.

LOCAL machine tool trade is still quiet. Purchases are entirely for replacement and seldom consist of more than one or two tools. The prospective buying list is fairly long and includes the Aluminum Co. of America, which is making progress with plans for its new Canadian works, and the Crucible Steel Co. of America, which recently placed the steel for new buildings at its Park works, Pittsburgh, and is also rehabilitating that plant.

Sherman & Sherman, West Middlesex, Pa., operating a local Ford sales and service station are in the market for a cylinder re boring machine, lathe, drill press and other equipment to replace that destroyed by fire on Oct. 2.

Work is in progress on the addition to the plant of the Kier Fire Brick Co., Salina, Pa., totaling about 50,000 sq. ft., to cost approximately \$100,000 with equipment. Headquarters are in the Oliver Building, Pittsburgh.

The Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, is arranging for the erection of an addition to the plant of the Columbia Cement Co., Fultonham, near Zanesville, Ohio, a subsidiary, to increase the capacity to about 5000 bbl. per day, or double the present output. The expansion is estimated to cost \$1,500,000, with machinery.

Eric F. Wood, Hardy Hays Building, Pittsburgh, architect, will begin the construction of a two-story and basement automobile service, repair and garage building, 106 x 150 ft., to cost \$125,000.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have inquiries out for a punch and shear suitable for ½-in. plate stock; also for a locomotive type boiler, about 75 hp.

The Consolidated Power & Light Co., Kenova, W. Va., is said to be contemplating the installation of coal-handling equipment at its power plant.

The A. F. Thompson Mfg. Co., Eighth and First Streets, Huntington, W. Va., manufacturer of stoves, etc., is reported to be negotiating for the purchase of the plant of the Saks Stamping Co., Westmoreland, W. Va., manufacturer of enamelware. It is purposed to expand the work and arrange departments for stove manufacture. A. F. Thompson is president.

The Board of Education, Martinsburg, W. Va., plans the installation of manual training equipment in its proposed high school at Lambert Field to cost \$310,000, for which plans are being completed.

The Latrobe Electric Steel Co., Latrobe, Pa., has awarded a general contract to the Fort Pitt Bridge Co., Pittsburgh, for its proposed one-story mill, 70 x 400 ft., to cost \$130,000 with equipment. M. W. Saxman is president.

The Lake Erie Limestone Co., Youngstown, Ohio, will proceed with the construction of a new crushing and loading plant at its properties at Hillsville, Pa., to cost \$85,000.

The new drop forging plant of the Lebanon Drop Forge Co., Lebanon, Pa., being erected by the Truscon Steel Co., will be completed in about three weeks. Since the destruction of the old plant by fire some time ago, production has been on a temporary basis in a small adjacent shop. The present facilities will be continued in conjunction with the new plant, as well as the use of the output of 15 hammers in another nearby shop.

Milwaukee

MILWAUKEE, Oct. 12.

JUDGING by the number of new orders being received by machine shops and foundries, prospects for an increasing call for machine tools are growing brighter. There is a moderately active movement at present, which in general is considerably in excess of last fall, and users apparently are now figuring on more than merely replacements. Milling machine builders in this center are sharing in the business being put out by several of the larger automobile companies, whose inquiries

indicate that there is still considerable equipment to be acquired to meet the fall and winter production schedules.

The Wisconsin Parts Co., Oshkosh, Wis., manufacturer of automobile, truck and bus axles, transmissions, etc., will invest between \$75,000 and \$100,000 in a machine shop addition and equipment. Ground was broken Oct. 1 for an extension, 60 x 185 ft., to the main building at 571 High Street. The general contractors are Ben B. Ganther & Co., Oshkosh.

The Phoenix Mfg. Co., Eau Claire, Wis., manufacturer of sawmill, planing mill and general wood-working machinery, which has been in financial litigation for several months, probably will be rehabilitated and resume production within a short time. The property, appraised at \$800,000, was bid in for \$36,000 at an auction to foreclose a first mortgage of \$330,000 held by the Union Trust Co., Cleveland, the bidder, W. P. McConnoughey of Cleveland, acting in behalf of the bondholders. The logging equipment department probably will be reorganized first.

The Dallman Machine & Mfg. Co., 819-935 Winnebago Street, Milwaukee, has purchased the machinery, equipment and gear manufacturing business of the Western Rawhide & Belting Co., 901 Winnebago Street, and has leased additional space for an extension practically doubling its capacity. The Dallman company manufactures tractor pulleys and specialties and does a general machine shop, tool, die and fixture business. The Western company will henceforth devote its attention to the manufacture of belting. William Dallman is vice-president and general manager of the Dallman company.

The Jenkins Machine Co., Sheboygan, Wis., manufacturer of wood-working machinery, which recently acquired the plant and property of the defunct Falls Motors Corporation, Sheboygan Falls, Wis., has sold its present plant in Sheboygan to the R. H. Thieman Co., Ford and Lincoln distributor, which will remodel the buildings for a garage, display and sales rooms and a machine and service shop. The Jenkins company will transfer its operation to Sheboygan Falls about Jan. 1, at which time the Thieman company will take possession.

The Milwaukee Department of Public Works is taking bids for alterations in and additions to the stoker drive in the power plant in the City Hall, Oneida, East Water and Market Streets. R. E. Stoelting is commissioner.

The Universal Cement Mold Co., North Milwaukee, Wis., has been organized by P. J. Harrington, J. L. Doyle and James Murphy to manufacture and fabricate metal forms and molds for the production of cement building materials. The capital stock consists of 2000 shares of common stock without par value.

Metzner, Eberhardt & Durwald, Madison, Wis., have plans by M. P. Schneider, 401 West Doty Street, local, for the construction of a \$35,000 garage, sales and maintenance building, 80 x 85 ft., two stories and part basement. Work will start about Oct. 26.

The Harnischfeger Corporation, Milwaukee, will build an addition costing about \$10,000 to its main works at Thirty-eighth and National Avenue. It will provide practically all of the necessary equipment from its own machine tool departments.

Cleveland

CLEVELAND, Oct. 12.

MACHINE tool business continues fairly good, although sales are not as numerous as last month owing to quietness in the automotive industry. Single tool orders, however, and inquiries show an increase. Some local dealers are figuring on more inquiries than for many weeks, practically all for single machines, which are well distributed among various industries. No new railroad business is reported. Several machines on the recently issued Nickel Plate list have not yet been placed.

The Youngstown Welding Co., Youngstown, Ohio, plate fabricator and manufacturer of truck tanks, will build a new plant, 70 x 200 ft. W. D. McKay is president.

The Defiance Automatic Screw Co., Defiance, Ohio, is having plans prepared for a new factory.

The Hiner Structural Steel Co., Canton, Ohio, plans the erection of a 60 x 150 ft. addition to its plant at Louisville, Ohio.

The Dueber-Hampden Watch Co., Canton, Ohio, has been acquired by a group of Cleveland men, including Fred K. Gatch and A. M. Dueber. The manufacture of automobile dash clocks will be added to the present products.

The Hudson Lumber Co., Kenmore, Ohio, is in the market for wood-working machinery and transmission and conveying equipment. D. A. Purington is president and general manager.

Canada

TORONTO, Oct. 12.

AN active demand for machine tools for replacement features this market, but little business is reported for new works. Good sales have recently been made to automobile manufacturers and a number of inquiries are appearing for single tools for garages and repair shops. The demand for mining machinery has strengthened. Increased business among steel plants has resulted in some buying of tools by the larger makers. It is the general opinion that the last quarter will show much better returns than in any quarter this year or in 1924.

Joseph Harris and associates, Toronto, manufacturers of non-metallic and metallic tubing for electrical purposes, have purchased the A. M. Ross factory at Whitby, Ont., which will be immediately equipped for manufacturing.

According to a statement by R. S. Morgan, local manager of the Hotpoint works at Stratford, Ont., of the Canadian General Electric Co., this plant will close around the first of the year, and arrangements will be made for the transfer of the business to Toronto.

The Blue Quartz Mines, Ltd., Matheson, Ont., are making arrangements for building a 100-ton concentration mill.

G. N. Clermont, 1160 St. Denis Street, Montreal, will build a garage and is interested in equipment.

H. Provencher, 5179-a St. Denis Street, Montreal, is contemplating the purchase of equipment for a public garage.

The Chatham Malleable Steel Co., 148 Inches Street, Chatham, Ont., has started work on an addition to its steel works and will award additional building contracts and purchase some equipment.

It is reported that two 14,000-hp. units will be developed at Chats Falls on the Ottawa River in Pontiac County, according to plans of the Kingdon Mining, Smelting & Refining Co. About half the output will be used by the company, and it is understood that negotiations are under way for the disposal of the remainder to the Ottawa Light, Heat & Power Co. It is stated that the present proposed development is but the first unit of a development of 150,000 hp.

The City Council, Niagara Falls, Ont., recently authorized the expenditure of \$65,000 on extensions and improvements to the electric light plant and system. W. J. Seymour is clerk.

The city of Sydney, N. S., is contemplating the installation of a crude oil engine in a power plant to cost \$15,000.

The Quebec Pulp Co., Chicoutimi, Que., which has taken over the Chicoutimi Pulp Co., is contemplating the erection of a paper mill there or in the vicinity of Chicoutimi.

Western Canada

M. Hemmingsen, Mill Bay, B. C., will start work immediately on the erection of a large sawmill.

The Brackmen-Ker Milling Co., New Westminster, B. C., will double the capacity of its grain elevator at a cost of \$50,000.

The Monitor Furnace Co., Cincinnati, will reduce its par value preferred stock from \$100 to \$25 and present shareholders will receive new shares in the ratio of four to one old share. Growth of the company's business also requires the issuance of 4000 additional shares of new preferred stock of \$25 par value, which will give \$100,000 working capital.

Stockholders of the Jamestown Car Parts Mfg. Co., Jamestown, N. Y., manufacturer of automobile radiators, voted to change the name of the company to the Jamestown Metal Equipment Corporation. The company will also manufacture metal furniture products and is installing equipment in a new addition for this work. Gustave A. Lawson is secretary and general manager.

The Milwaukee Concrete Mixer Sales Co., 955 Thirtieth Street, Milwaukee, has amended its corporate articles to provide full authority for manufacturing as well as merchandising concrete mixers and similar contractors' equipment, and at the same time changes its name to the Mixermobile Corporation.

Trade Changes

The Brownie Mfg. Co., Inc., manufacturer of hardware specialties, has moved from Chicago to 2921-23 Pennsylvania Street, Fort Wayne, Ind. This organization has dissolved its Illinois corporation and has incorporated under the laws of the State of Indiana.

The Davis Machinery Exchange has opened an office and warehouse at 1612 Oakwood Avenue, Toledo, Ohio, for the sale of used machinery and surplus materials. The company has a shop in connection with its warehouse for rebuilding machinery. M. C. Davis, manager, has had considerable experience in the used machinery business.

The Cincinnati Planer Co., the Cincinnati Bickford Tool Co., the Cincinnati Milling Machine Co., the Lodge & Shipley Machine Tool Co. and the Acme Machine Tool Co., all of Cincinnati, have given the exclusive sale of their lines to the following agents in the South: Woodward, Wight & Co., Ltd., New Orleans; the Hausman-Harwick Machine Tool Co., Birmingham; R. S. Armstrong, Brother & Co., Atlanta, Ga., and the Huey & Philip Hardware Co., Dallas, Tex.

The Crocker-Wheeler Co., Ampere, N. J., announces a change in the company name, effective Nov. 1. The new name of the company will be Crocker-Wheeler Electric Mfg. Co.

The Wagner Electric Corporation has moved its Dallas office and service station to 2815 Commerce Street, that city.

Thomas H. Livezey & Co. have moved their plant and office from 2414 Sedgley Avenue, Philadelphia, to the corner of Luzerne and American Streets, where their manufacturing facilities are materially increased.

The Equitherm Engineering Corporation, 8 Bridge Street, New York, has absorbed the Equitherm Control Corporation and will continue to manufacture thermostats and other temperature controlling instruments. The assets taken over include a plant at 13 Tillary Street, Brooklyn.

The Lehigh Structural Steel Co., Altoona, Pa., has removed its New York district office from 29 Broadway to larger quarters at 17 Battery Place. The office will be in charge of T. R. Mullen, vice-president of the company, succeeding Clyde Green, former district manager, who resigned recently. L. G. Nieman continues as resident engineer.

Arthur Appleton, New York district sales representative of Alfred Box & Co., Philadelphia, overhead cranes and hoists, has moved from 29 Broadway to 17 Battery Place.

The Barstow Sales Co., St. Louis, sales agent in that territory for the Juruick Engineering Corporation, Allentown, Pa., manufacturer of refrigerating machinery, has removed to larger quarters at 3150 Washington Boulevard, St. Louis.

The Watson Engineering Co., 140 Cedar Street, New York, will be conducted in the future as Wilbur Watson & Associates. The personnel will continue as heretofore, Wilbur J. Watson, Stanley H. Chadwick and Charles D. Watson. A Philadelphia office has been established at 1411 Walnut Street in charge of R. E. Reynolds, resident engineer.

The Abrasive Co., Philadelphia, has established a district office in Detroit at 149 Larned Street, East, in charge of W. A. MacFarland, who has been the representative of the Abrasive Co. in the Detroit district for some time.

General offices of Edgar T. Ward's Sons Co., formerly located in Newark, N. J., now are in the office building of the Columbia Steel & Shafting Co., Carnegie, Pa. The latter controls the Ward company.

Crottsly & Brown have moved into new quarters at 33 South Desplaines Street, Chicago, where they have offices and a warehouse. They will continue to handle ferroalloys and sheet steel and also carry a stock of imported wave cut files, double edge hack saw blades and abrasives.

Industrial News Notes

Extensive additions to productive facilities of Somerville Stove Works, Somerville, N. J., just completed, consist of a new gas range and combination range mounting department, press and die department, welding department, drilling department, japanning and enamelling plant, testing equipment, pattern shop, pattern storage warehouse, finished goods warehouse, crating and shipping department, exhibition rooms and new business offices. The new buildings contain over 60,000 sq. ft. of floor space. The plant has been equipped throughout with new, modern machinery for use in the manufacture of gas ranges, coal ranges, stoves and heaters by precision methods, with the ultimate attainable economy of cost.

Earnings of Lancaster Iron Works

The Lancaster Iron Works, Inc., Lancaster, Pa., has disposed of a \$500,000 bond issue consisting of first mortgage 6 per cent sinking fund gold bonds, the proceeds of which are being used to retire bank loans used in the expansion of the business. The Lancaster Iron Works, Inc., which has been in business since 1910, builds tanks and steel plate structures. Due to the fact that the demand for tanks and steel plate construction is seasonal, the company in 1920 decided to engage in the manufacture of brick making machinery and for that purpose the plant and equipment of the Arnold-Creager Co., New London, Ohio, was acquired. In addition, it owns a large interest in the Lancaster Brick Co., manufacturer of sand molded and building brick. Through a subsidiary, F. J. Ryan & Co. of Philadelphia, engineers specializing in industrial furnaces and heat-treating equipment, the Lancaster Iron Works receives business in castings and plate work.

To provide for additional manufacturing facilities, the company has recently purchased nine acres of industrial property in Lancaster, including the ground, machinery, buildings and equipment of the Monitor Bi-Loop Radiator Co., situated on the Pennsylvania Railroad. Plans are under way to remodel the boiler shop of the purchased plant, thus increasing shop capacity very materially within the next 30 days.

Net earnings of the company for the last 5½ years averaged \$119,330.41. For the last 3½ years, earnings have averaged \$156,257.07, and for the first six months of 1925 \$77,323.91. These figures appear in a financial statement recently issued by the company. The management of the business is in the hands of Walter W. Posey, president, and A. C. Scully secretary and treasurer, who have been in active charge of the business since its inception.

The Ludlum Steel Co. reports net income for the eight months ended Aug. 31 of \$262,264, after charges and taxes. This compares with \$160,159 in the same period last year. Unfilled orders as of Sept. 5, amounted to \$284,650 compared with \$103,424 a year ago.

The Ohio Steel Foundry Co., Lima, Ohio, has increased its capitalization from \$1,500,000 to \$2,250,000. The company states that it is not expanding its activities at present.

The Barbee Wire & Iron Co., Lafayette, Ind., went into voluntary receivership on Sept. 11, this action having been taken to prevent the sale of its business in the State court. Assets were listed at \$265,000 and liabilities at \$102,000. Charles Surprise, United States Commissioner at Hammond, Ind., was appointed receiver.

The Midland Steel Products Co. reports net profits for the first six months of \$1,418,000, a favorable showing against net profits of \$1,807,000 for the entire year 1924. The company reports \$4,000,000 cash on hand as of June 30.

The Penn Seaboard Steel Corporation has eliminated a funded debt of \$1,635,498, leaving it without fixed charges. This was made known in an undated announcement Aug. 21. Since 1921 the company has canceled obligations of \$5,000,000. Its principal activities are now centered in the New Castle plant where the ratio of operations has been scaled up recently with an increase in new orders for railroad equipment.

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Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates	
	Per Lb.
Bars:	
Refined iron bars, base price.....	3.24c.
Swedish charcoal iron bars, base.....	7.00c. to 7.25c.
Soft steel bars, base price.....	3.24c.
Hoops, base price.....	4.49c.
Bands, base price.....	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base.....	3.34c.
Channels, angles and tees under 3 in. x ¼ in. base.....	3.24c.
Steel plates, ¼ in. and heavier.....	3.34c.

Merchant Steel	
	Per Lb.
Tire, 1½ x ½ in. and larger.....	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)...	3.65c.
Toe-calk, ½ x ½ in. and larger.....	4.20c.
Cold-rolled strip, soft and quarter hard.....	7.00c.
Open-hearth spring steel.....	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds and hex.....	4.00c.
Squares and flats.....	4.50c.
Standard tool steel, base price.....	15.00c.
Extra tool steel.....	18.00c.
Special tool steel.....	23.00c.
High-speed steel, 18 per cent tungsten.....	70c.

Sheets	
Blue Annealed	
	Per Lb.
No. 10.....	3.89c.
No. 12.....	3.94c.
No. 14.....	3.99c.
No. 16.....	4.09c.

Box Annealed—Black	
	Per Lb.
Soft Steel	
C. R. One Pass	Per Lb.
Nos 18 to 20.....	3.80c. to 3.95c.
Nos. 22 and 24.....	3.85c. to 4.20c.
No. 26.....	3.90c. to 4.25c.
No. 28*.....	4.00c. to 4.35c.
No. 30.....	4.20c. to 4.55c.

Galvanized	
	Per Lb.
No. 14.....	4.10c. to 4.35c.
No. 16.....	4.25c. to 4.50c.
Nos. 18 and 20.....	4.40c. to 4.65c.
Nos. 22 and 24.....	4.55c. to 4.80c.
No. 26.....	4.60c. to 4.95c.
No. 28*.....	5.00c. to 5.25c.
No. 30.....	5.50c. to 5.75c.

*No. 28 lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe	
Standard Steel	
Black	Galv.
½ in. Butt....	46 29
¾ in. Butt....	51 37
1-3 in. Butt....	53 39
2½-6 in. Lap..	48 35
7 & 8 in. Lap..	44 17
11 & 12 in. Lap.	37 12
Wrought Iron	
Black	Galv.
½ in. Butt....	4 +19
¾ in. Butt....	11 + 9
1-1½ in. Butt.	14 + 6
2-in. Lap....	5 +14
3-6 in. Lap...	11 + 6
7-12 in. Lap...	3 +16

Bolts and Screws	
Machine bolts, cut thread, 40 and 10 per cent off list	
Carriage bolts, cut thread, 30 and 10 per cent off list	
Coach screws, 40 and 10 per cent off list	
Wood screws, flat head iron,	
80, 20, 10 and 5 per cent off list	

Steel Wire	
Base, Price† on No. 9 GAGE AND COARSER	Per Lb.
Bright, basic.....	4.25c.
Annealed, soft.....	4.50c.
Galvanized, annealed.....	5.15c.
Coppered, basic.....	5.15c.
Tinned, soft Bessemer.....	6.15c.

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire	
BASE PRICE	
High brass sheet.....	19½c. to 20½c.
High brass wire.....	19½c. to 20½c.
Brass rods.....	16½c. to 17½c.
Brass tube, brazed.....	27½c. to 28½c.
Brass tube, seamless.....	23½c. to 24½c.
Copper tube, seamless.....	24½c. to 25½c.

Copper Sheets	
Sheet copper, hot rolled, 21½c. to 22½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates	
Bright Tin	Coke—14x20
Grade "AAA"	Grade "A"
Charcoal 14x20	Charcoal 14x20
IC... \$11.25	\$8.85
IX... 12.85	10.85
IXX... 14.40	12.55
IXXX... 15.75	13.85
IXXXX... 17.00	15.05
	Prime Seconds
	80 lb... \$6.15
	90 lb... 6.30
	100 lb... 6.45
	IC... 6.65
	IX... 7.85
	IXX... 9.00
	IXXX... 10.35
	IXXXX... 11.35

Terne Plates	
8 lb. coating, 14 x 20	
100 lb.....	\$7.00 to \$8.00
IC.....	7.25 to 8.25
IX.....	8.25 to 8.75
Fire-door stock.....	9.00 to 10.00

Tin	
Straits, pig.....	63½c.
Bar.....	66½c. to 68½c.

Copper	
Lake ingot.....	16½c.
Electrolytic.....	16½c.
Casting.....	16 c.

Spelter and Sheet Zinc	
Western spelter.....	9½c.
Sheet zinc, No. 9 base, casks.....	12½c.; open, 13c.

Lead and Solder*	
American pig lead.....	10½c. to 12½c.
Bar lead.....	12½c. to 13½c.
Solder, ½ and ½ guaranteed.....	40c.
No. 1 solder.....	37c.
Refined solder.....	30½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.....	75c. to 90c.
Commercial grade, per lb.....	35c. to 50c.
Grade D, per lb.....	25c. to 35c.

Antimony	
Asiatic.....	20c. to 21c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb.....	30c. to 31c.

The market continues firm. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible.....	12.00
Copper, heavy wire.....	11.75
Copper, light bottoms.....	9.50
Brass, heavy.....	7.25
Brass, light.....	6.00
Heavy machine composition.....	9.00
No. 1 yellow brass turnings.....	8.50
No. 1 red brass or composition turnings.....	8.25
Lead, heavy.....	7.75
Lead, tea.....	6.25
Zinc.....	4.50
Cast aluminum.....	18.50
Sheet aluminum.....	18.50

